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# 1997 ANNUAL GROUND WATER SAMPLING REPORT LIVINGSTON RAIL YARD LIVINGSTON, MONTANA

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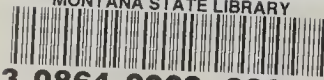
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August 15, 1997

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# **1997 ANNUAL GROUND WATER SAMPLING REPORT LIVINGSTON RAIL YARD LIVINGSTON, MONTANA**

*Submitted by:*

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Superfund Program  
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August 15, 1997

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- APPENDIX B - Data Validation Report
- APPENDIX C - MDEQ Laboratory Analytical Results



## 1.0 INTRODUCTION

This report is submitted to the Montana Department of Environmental Quality (MDEQ) from the Burlington Northern Santa Fe Railroad Company (BNSF). It presents the results of ground water samples and water level measurements collected during the November 1996 semiannual ground water sample round and the May 1997 annual sample round at the Livingston Rail Yard (LRY), in Livingston, Montana.

The LRY is located in the northeast part of the city of Livingston, Montana as shown in Figure 1.0. It was constructed in 1883 by the Northern Pacific Railroad (NPRR) and, except for an 18-month period during 1986 and 1987, has operated continuously since that time. Long-term locomotive fueling operations at the LRY resulted in a plume of free and residual diesel fuel near the water table of the underlying aquifer beneath a portion of the LRY. Various locomotive maintenance and waste water handling operations resulted in the presence of chlorinated volatile organic compounds (VOCs) in soils at specific areas around the LRY and also in a dissolved plume of chlorinated VOCs in the ground water beneath and downgradient of the site.

Burlington Northern Railroad (BNRR), the successor to NPRR, began environmental investigations at the LRY in October 1985. Since 1989, the LRY has been investigated and remediated under a Modified Partial Consent Decree (MPCD) between BNRR (later BNSF) and the MDEQ. The MPCD, signed by Charles C. Lovell, U.S. District Judge, on April 27, 1990, specifies the process by which the investigation and remediation of environmental conditions at the LRY will proceed. Regularly scheduled ground water monitoring has continued since May 1989.

The LRY site is underlain by an alluvial aquifer composed of coarse-grained sand and gravel. This aquifer is referred to as the Livingston aquifer.





Beneath most of the LRY, the water table of this aquifer is 15 to 25 feet below the ground surface.

Section 2.0 of this report presents the number of samples collected, the sample dates, and the analytical methods used for the November 1996 and May 1997 sample events. Section 3.0 presents the analytical results of these ground water samples. Results are presented on tables showing the November 1996 and May 1997 sample events and on maps showing the extent of dissolved chlorinated VOCs based on the May 1997 analytical results. The long-term declines in VOC concentrations are illustrated on graphs showing chlorinated VOC concentrations at specific wells during all ground water sample events since May 1989.

## **2.0 GROUND WATER SAMPLE EVENTS**

The November 1996 and May 1997 sample rounds were conducted under the ground water sampling schedule approved by the MDEQ in February 1996. This sampling schedule specifies the sampling of twelve monitoring wells during the semiannual event (November) and twenty-eight monitoring and private wells during the annual sample round (May).

The locations of all sample points are shown on Figure 1.0. Tables 2, 3, and 4 summarize the analytical results for tetrachloroethene (PCE); trichloroethene (TCE); and cis-1,2-dichloroethene (DCE), respectively. Laboratory analytical results are presented in Appendix A. A data validation report is included as Appendix B. The details of each sample event are presented below.

### **2.1 November 1996 Semiannual Ground Water Sampling Event**

The November 1996 semiannual sampling event was conducted November 11-14, 1996. During this sample round, nine of the scheduled twelve monitoring wells were sampled (Table 1.0). The three wells that were



not sampled were L-87-5, 89-4, and 92-1. Monitoring well L-87-5 was dry and could not be sampled. Monitoring well 89-4 had been vandalized and was not suitable for sampling at that time. It has since been repaired and was sampled during the May 1997 sample round. Monitoring well 92-1 was mistakenly not sampled during the November sample round.

As shown on Table 1, eleven samples were analyzed as part of this event: nine were primary samples collected at monitoring wells, one was a field duplicate, and one was a trip blank. All of these samples were analyzed for purgeable halogenated organic compounds by EPA Method 601.

## **2.2 May 1997 Annual Ground Water Sampling Event**

The May 1997 annual ground water sampling event was conducted May 27 through June 18, 1997. During this sample round, twenty-three of the scheduled twenty-eight monitoring wells were sampled (Table 1.0). The five wells that were not sampled were the Rainbow private well and monitoring wells 8, 92-2, 94-1, and 94-2. The Rainbow well could not be sampled during May 1997 because its owner had not yet set up the well for summer irrigation use. Monitoring well 8 was damaged by a snowplow during the winter of 1996-7. The well head has since been repaired; however, the well was dry in May 1997 and may have been partially filled with dirt when it was damaged. Monitoring wells 92-2, 94-1, and 94-2 were not accessible for sampling during May and June 1997 due to flooding of the Yellowstone River.

Forty-three samples were analyzed as part of the May 1997 sample event: 36 were primary samples collected at monitoring and private wells; four samples were field duplicates; and three samples trip blanks. Twenty-seven of the primary samples were analyzed for purgeable halocarbons by EPA Method 601 while seven were analyzed for VOCs by EPA Method 524.2. Fourteen of the primary samples were analyzed for the natural attenuation parameters (NAPs) dissolved oxygen (DO),  $\text{SO}_4$ ,  $\text{NO}_3$ ,  $\text{Fe}^{2+}$ , and  $\text{CH}_4$ . NAP analyses were





conducted to evaluate the degree of natural biodegradation of diesel fuel occurring in the aquifer beneath the free and residual product plume.

### **3.0 SAMPLE RESULTS AND DISCUSSION**

This section presents the results of samples taken during the November 1996 and May 1997 sampling events. Analytical results for PCE, TCE, and cis-DCE are presented in on Tables 2.0 through 4.0 respectively. Sample results from the May 1997 sample event are also presented on Figures 2.0 through 4.0 showing the distribution of dissolved PCE, TCE, and cis-DCE concentrations. Analytical results for the NAPs are shown on Table 5.0.

The apparent thickness of the free product was measured in monitoring and observation wells during both sample events. Thickness measurements represent the "apparent" free product thickness as opposed to the actual thickness. The apparent thickness of free product is approximately two to four times greater than the actual free product thickness in the aquifer. All thickness measurements are listed in Table 6.0.

#### **3.1 Ground Water VOC Sample Results**

November 1996 and May 1997 ground water samples contained dissolved chlorinated-VOC concentrations that continued the long-term decline observed during the past eight years of ground water monitoring. These concentration declines are a result of the limited total mass of chlorinated VOCs originally present at the LRY and also VOC removal during the source control activities instituted on the LRY during the Remedial Investigation (RI) and the Feasibility Study (FS). Source control activities were described in the Final Remedial Investigation Report (Envirocon, 1994).

Figure 2.0 shows the distribution of dissolved PCE based on the May 1997 annual sample round. PCE is present in a plume extending from the Electric Shop northeastward past the Yellowstone River. Although PCE is



detectable over a large area, PCE concentrations above 100 ug/l are restricted to the area beneath and downgradient from the northern half of the Electric Shop and the center of the Locomotive Shop. The remainder of the plume contains PCE concentrations of less than 100 ug/l.

Figure 3.0 shows the distribution of dissolved TCE based on the May 1997 sample event. Most monitoring wells contained TCE concentrations below the 5 ug/l Maximum Contaminant Level (MCL). TCE concentrations above the 5 ug/l MCL are restricted to a narrow area stretching from the Waste Water Treatment Plant (WWTP) northeastward towards the Yellowstone River.

Figure 4.0 shows the distribution of cis-DCE concentrations in the aquifer for May 1997. No cis-DCE concentrations were detected above the 70 ug/l MCL during this sample event. The primary source area for cis-DCE is the WWTP area, including the WWTP grit chambers and the WWTP sump.

Monitoring wells 94-1 and 94-2 are east of the map area shown in Figure 1.0. Monitoring well 94-1 is located approximately 1,000 feet east of the Yellowstone River and 1,500 feet north of Highway 89. Monitor Well 94-2 is located approximately 1,000 feet east of the Yellowstone River and 100 feet south of Highway 89. As shown on Table 1.0, both of these wells have contained detectable PCE in past sample round; however, neither of these wells contained PCE above the 0.5 ug/l detection limit in November 1996. Wells 94-1 and 94-2 were not accessible for sampling during May 1997 due to flooding of the Yellowstone River.

Vinyl chloride was detected in ground water samples from well L-87-2 at concentrations of 35 ug/l (November) and 20 ug/l (May). Vinyl chloride was also detectable downgradient from the WWTP at concentrations of 1.8 ug/l (November) and 0.34 ug/l (May) in well L-88-10. It is suspected that this vinyl chloride is created by degradation of cis-1,2-DCE in the hydrocarbon smear zone beneath the WWTP area. The MCL for vinyl chloride is 2 ug/l.



methylnaphthalene, and naphthalene. The naphthalene and methylnaphthalenes are common gasoline constituents and are probably related to the other gasoline-type hydrocarbons that have always been detected at this well.

### 3.2 Natural Attenuation Parameter Results

Fourteen samples from thirteen wells were analyzed for DO, SO<sub>4</sub>, NO<sub>3</sub>, Fe<sup>+2</sup>, and CH<sub>4</sub>. These parameters provide insight into the extent of natural biodegradation occurring in the ground water beneath and around the free product plume.

Oxygen, NO<sub>3</sub>, and SO<sub>4</sub> are electron acceptors used by petroleum-degrading bacteria while Fe<sup>+2</sup> and CH<sub>4</sub> are products of petroleum degradation (MPCA, 1996; Sturman and Meyers, 1997). Under aerobic conditions, biodegradation of hydrocarbons proceeds utilizing oxygen as the terminal electron acceptor. As oxygen is depleted, the alternative electron acceptors utilized are, in order of importance, NO<sub>3</sub>, Mn<sup>+4</sup>, Fe<sup>+3</sup>, SO<sub>4</sub>, and ultimately CO<sub>2</sub>. Utilization of Fe<sup>+3</sup> yields soluble Fe<sup>+2</sup> as a reaction product. Utilization of CO<sub>2</sub> yields CH<sub>4</sub> as a reaction product. The reactants and products of biodegradation that are most easily measured are DO, NO<sub>3</sub>, SO<sub>4</sub>, Fe<sup>+2</sup>, and CH<sub>4</sub>; therefore, these were the compounds analyzed for during the May 1997 sample round.

Seven of the thirteen wells sampled for NAPs are within or immediately downgradient of the free product plume. The remaining six wells represent ground water that is unaffected by biodegradation in the plume. Figure 13.0 shows the locations of the thirteen wells sampled for NAPs.





Table 6.0 lists the NAP results for all of the samples. Dissolved oxygen concentrations show a clear distinction between wells within or near the hydrocarbon plume and those unaffected by the hydrocarbon. With the exception of well 95-1, samples from within the plume area have DO concentrations of 0.75 to 2.4 mg/l. Although well 95-1 is within the plume, it is on the upgradient end (Figure 13.0). Therefore ground water at this location contains a DO concentration similar to background wells away from the plume. Samples from wells outside the plume area contained DO concentrations ranging from 5.2 to 9.4 mg/l. This difference in DO concentrations indicates that DO is being utilized by petroleum-degrading microbes within the plume area.

Nitrate concentrations were all less than 1 mg/l for wells within the plume (with the exception of well 95-1). In contrast, most of the wells away from the plume contained nitrate concentrations above 1 mg/l. Apparently,  $\text{NO}_3$  is also being used as an electron acceptor by petroleum-degrading microbes within the plume area.

None of the wells away from the plume contained detectable  $\text{Fe}^{+2}$ . Three wells within the plume (L-87-2, L-87-7, and L-87-8) contained detectable  $\text{Fe}^{+2}$ . These were the three wells where the lowest DO concentrations were measured. This indicates that  $\text{Fe}^{+2}$  is being generated by reduction of  $\text{Fe}^{+3}$  within the plume by petroleum-degrading microbes.

Wells away from the plume contained methane concentrations of 2 to 3 ppm. In contrast, five of the seven samples from wells in or near the plume contained elevated methane concentrations. The wells with the lowest DO concentrations also contained the largest methane concentrations. This indicates that in the most anoxic parts of the plume,  $\text{CO}_2$  is being reduced to  $\text{CH}_4$  by petroleum-degrading microbes.



In summary, the NAP measurements reveal that petroleum-degrading microbes are utilizing a variety of the electron acceptors including oxygen,  $\text{NO}_3$ , and  $\text{Fe}^{+3}$  to biodegrade hydrocarbons. The only potential electron acceptor that does not show a clearly recognizable decline within the plume is  $\text{SO}_4$ . In the parts of the plume with the lowest DO concentrations, it is clear that microbes are utilizing  $\text{CO}_2$  as electron acceptors and producing  $\text{CH}_4$  as a product. The most well-oxygenated part of the plume is the upgradient end as indicated by the results from well 95-1. This well is located in an area that contained measurable free product several years ago; however, since its installation in January of 1995, well 95-1 has not contained any measurable product. This probably indicates that hydrocarbons in the upgradient end of the plume are degrading more rapidly than the less well-oxygenated areas farther downgradient.

### 3.3 Free-Product Thickness Measurements

Table 6.0 shows all of the free-product thickness measurements taken between August 1994 and May 1997. Figure 14.0 shows the general outline of the free product plume, the location of all wells measured during May 1997, and the May free product thickness measurements. As shown on Figure 13.0, many of the wells within the general outline of the free product plume do not contain any measurable free product. Moreover, of the wells containing measurable free product, most contain less than one-quarter-foot total apparent thickness. Assuming that apparent product thickness is two to four times the actual thickness, this reveals that the majority of the plume contains less than one inch of free product.

## 4.0 CONCLUSIONS

This report presents the results of the eighth complete year of ground water sampling at the LRY. The two primary ground water concerns at the LRY are a plume of dissolved chlorinated VOCs in the aquifer and a plume of





free and residual diesel fuel at the water table. These two plumes had separate source areas and only partially overlap.

The concentrations of dissolved VOCs have declined significantly since 1989. The 1996 and 1997 ground water monitoring results indicate that this trend is continuing. At most monitoring well locations, the dissolved chlorinated VOC concentrations have declined more than 80 percent since 1989.

The apparent thickness of the free product plume has also declined since regular measurements began in 1989. This is at least in part due to biodegradation within the plume by indigenous microbes. Measurements of both reactants and products of biodegradation within the plume area reveal that biodegradation is occurring within the plume area.



## 5.0 REFERENCES

MPCA, 1996, Assessment of Natural Biodegradation at Petroleum Release Sites; Minnesota Pollution Control Agency Fact Sheet #3.21; May 1996.

Sturman and Meyers, 1997, Intrinsic Bioremediation as a Remedial Option at Petroleum Contaminated Sites; Notes and appendices from presentation.



## **TABLES**





**Table 1.0**  
**November 1996 and May 1997 Ground Water Samples**

Sample Number	Sample Location	Sample Date	Analyses
140101-1530	94-1	11/11/97	601
140101-1531	89-9	11/11/97	601
140101-1532	L-88-10	11/12/96	601
140101-1533	L-87-8	11/12/97	601
140101-1534	90-3	11/12/97	601
140101-1535	90-3 dup.	11/12/97	601
140101-1536	L-87-2	11/12/97	601
140101-1537	92-2	11/12/97	601
140101-1538	89-3	11/12/97	601
140101-1539	94-1	11/13/97	601
140101-1540	Trip blank	11/14/97	601
140101-1541	4	5/27/97	601
140101-1542	5	5/27/97	601
140101-1543	Trip blank	5/27/97	601
140101-1544	6	5/27/97	601
140101-1545	1	5/28/97	601
140101-1546	LS-11	5/28/97	601
140101-1547	90-3	5/28/97	601
140101-1548	89-6	5/28/97	601
140101-1549	89-6 dup.	5/28/97	601
140101-1550	89-10	5/28/97	601
140101-1551	L-87-3	5/29/97	601
140101-1552	3	5/29/97	601
140101-1553	L-88-10	5/29/97	524.2
140101-1554	Trip blank	5/29/97	601
140101-1555	L-88-13	5/29/97	524.2
140101-1556	L-87-8	5/29/97	524.2
140101-1557	L-87-7	5/29/97	524.2
140101-1558	L-87-7 dup.	5/29/97	524.2
140101-1559	L-87-4	5/29/97	524.2
140101-1560	L-87-2	5/30/97	524.2
140101-1561	89-4	5/30/97	601
140101-1562	L-87-5	5/30/97	601
140101-1563	92-1	5/30/97	601
140101-1564	89-3	6/2/97	601
140101-1565	L-88-10	6/3/97	NAP
140101-1566	L-87-3	6/3/97	NAP
140101-1567	L-87-1	6/3/97	NAP
140101-1568	89-9	6/3/97	601
140101-1569	89-9 dup.	6/3/97	601
140101-1570	89-2	6/4/97	601, NAP
140101-1571	L-87-2	6/4/97	NAP
140101-1572	Trip Blank	6/4/97	601
140101-1573	L-88-13	6/4/97	NAP
140101-1574	92-3	6/4/97	NAP
140101-1575	95-1	6/4/97	NAP
140101-1576	L-87-4	6/4/97	NAP
140101-1577	B Street	6/5/97	601
140101-1578	L-88-13	6/5/97	NAP
140101-1579	L-87-8	6/5/97	NAP
140101-1580	L-87-7	6/5/97	NAP
140101-1581	L-87-5	6/5/97	NAP
140101-1582	92-4	6/18/97	601
140101-1583	2	6/18/97	601, NAP

Notes:

NAP - Natural attenuation parameter analyses - SO<sub>4</sub>, NO<sub>3</sub>, Fe<sup>2+</sup>, CH<sub>4</sub>



**Table 2.0**  
**PCE Concentrations**  
**1997 Annual Ground Water Report**

Sample Location	August 1995	November 1995	May 1996	November 1996	May 1997
All concentrations in ug/l					
1		<0.5J			<0.5
2			<0.5J		0.5J
3			<0.5J		<0.5
4			<0.5J		<0.5
5	0.59	0.63	<0.5J		<0.5
6		1.2	1.4		<0.5
8					
89-1					NS (dry)
89-2	<0.5	<0.5	<0.5		<0.5
89-3	186	199	205	172	163
89-4	103	84	137	NS <sup>1</sup>	87
89-6			16		12
89-9	59	62		59	69
89-10			55		35
90-3			29	12	11
90-6	0.76	0.73			
92-1	124	109	55	NS <sup>2</sup>	85
92-2	24	27	9.7	21	NS <sup>3</sup>
92-3	0.75	<0.5J			
92-4	2.1	4.4	28		2.4
94-1	1.5	2.4	1.8	3.6	NS <sup>3</sup>
94-2	<0.5J	<0.5J	<0.5J	<0.5J	NS <sup>3</sup>
L-87-2	1.3 <sup>1</sup>	1.8	<0.5	<0.5	<0.5
L-87-3	69	89	76		44
L-87-4			<0.5		<0.5
L-87-5	61	51	64	NS (dry)	69
L-87-7					<0.5
L-87-8	2.8	3.9	2.4	2.4	2.5
L-88-10	29	40	30	29	19
L-88-13			16		15
LS-11	14	20	34		25
B-Street			<0.5		<0.5
Rainbow					NS <sup>4</sup>

## Notes:

<sup>1</sup> - value is from a field duplicate sample. Original sample detection limit was too high due to foaming in sample bottle.

J - Detectable but less than the practical quantification limit.

NS<sup>1</sup> - well 89-4 was vandalized and could not be sampled in November 1997

NS<sup>2</sup> - well 92-1 was mistakenly not sampled during November 1997

NS<sup>3</sup> - wells 92-2, 94-1, and 94-2 were not accessible for sampling during May 1997 due to flooding of the Yellowstone River.

NS<sup>4</sup> - the Rainbow Motel well was to operational during May 1997.



**Table 3.0**  
**TCE Concentrations**  
**1997 Annual Ground Water Report**

Sample Location	August 1995	November 1995	May 1996	November 1996	May 1997
All concentrations in ug/l					
1		<0.5			<0.5
2			<0.5		<0.5
3			<0.5		<0.5
4			<0.5		<0.5
5	<0.5	<0.5	<0.5		<0.5
6		<0.5	<0.5		<0.5
8					NS (dry)
89-2	<0.5	<0.5	<0.5		<0.5
89-3	0.73	0.59	1.4	0.82	0.97
89-4	1.6	1.5	1.2	NS <sup>1</sup>	1.1
89-6			<0.5J		<0.5J
89-9	2.9	2.7		2.4	5.6
89-10			5.5		4.3
90-3			2.6	2.1	1.2
90-6	<0.5	<0.5			
92-1	<0.5J	<0.5J	<0.5J	NS <sup>2</sup>	<0.5J
92-2	3.0	3.7	0.67	2.0	NS <sup>3</sup>
92-3	<0.5	<0.5			
92-4	<0.5	1.0	1.4		<0.5J
94-1	<0.5	<0.5	<0.5	<0.5	NS <sup>3</sup>
94-2	<0.5	<0.5	<0.5	<0.5	NS <sup>3</sup>
L-87-2	2.9 <sup>1</sup>	3.7	14	1.9	3.2
L-87-3	6.1	8.8	8.3		7.5
L-87-4			<0.5		<0.5
L-87-5	3.5	3.0	3.4	NS(dry)	5.0
L-87-7					<0.5
L-87-8	1.1	1.9	2.2	1.6	0.74
L-88-10	12	15	11	16	8.7
L-88-13			2.5		2.4
LS-11	6.4	6.8	6.8		5.6
B-Street			<0.5		<0.5
Rainbow					NS <sup>4</sup>

Notes:

<sup>1</sup> - value is from a field duplicate sample. Original sample detection limit was too high due to foaming in sample bottle.

J - Detectable but less than the practical quantification limit.

NS<sup>1</sup> - well 89-4 was vandalized and could not be sampled in November 1997

NS<sup>2</sup> - well 92-1 was mistakenly not sampled during November 1997

NS<sup>3</sup> - wells 92-2, 94-1, and 94-2 were not accessible for sampling during May 1997 due to flooding of the Yellowstone River.

NS<sup>4</sup> - the Rainbow Motel well was to operational during May 1997.





**Table 4.0**  
**cis-1,2-DCE Concentrations**  
**1997 Annual Ground Water Report**

Sample Location	August 1995	November 1995	May 1996	November 1997	May 1997
All concentrations in ug/l					
1		<0.5			<0.5
2			<0.5		<0.5
3			<0.5		<0.5
4			<0.5		<0.5
5	<0.5	<0.5	<0.5		<0.5
6		<0.5	<0.5		<0.5
8					NS (dry)
89-2	<0.5	<0.5	<0.5		<0.5
89-3	<0.5	<0.5	0.54	<0.5	<0.5
89-4	1.7	3.1	2.9	NS <sup>1</sup>	2.5
89-6			<0.5		<0.5
89-9	1.0	1.1		0.84	3.2
89-10			8.3		4.2
90-3			2.8	1.7	<0.5J
90-6	<0.5	<0.5			
92-1	8.6	12	21	NS <sup>2</sup>	8.6
92-2	6.0	4.1	0.74	1.6	NS <sup>3</sup>
92-3	<0.5	<0.5			
92-4	<0.5	<0.5J	0.81		<0.5
94-1	<0.5	<0.5	<0.5	<0.5	NS <sup>3</sup>
94-2	<0.5	<0.5	<0.5	<0.5	NS <sup>3</sup>
L-87-2	52 <sup>1</sup>	88	23	54	21
L-87-3	9.5	11	14		12
L-87-4			<0.5		<0.5
L-87-5	1.0	1.2	0.91	NS (dry)	3.3
L-87-7					<0.5
L-87-8	0.66	1.4	0.55	<0.5J	<0.5J
L-88-10	22	39	16	24	12
L-88-13			0.68		1.0
LS-11	19	9.0	10		5.9
B-Street			<0.5		<0.5
Rainbow					NS <sup>4</sup>

## Notes:

<sup>1</sup> - value is from a field duplicate sample. Original sample detection limit was too high due to foaming in sample bottle.

J - Detectable but less than the practical quantification limit.

NS<sup>1</sup> - well 89-4 was vandalized and could not be sampled in November 1997

NS<sup>2</sup> - well 92-1 was mistakenly not sampled during November 1997

NS<sup>3</sup> - wells 92-2, 94-1, and 94-2 were not accessible for sampling during May 1997 due to flooding of the Yellowstone River.

NS<sup>4</sup> - the Rainbow Motel well was to operational during May 1997.



**Table 5.0**  
**Comparison of MDEQ and BNSF Split Sample Results**

Sample Locations	BNSF Results (ug/l)	MDEQ VOC Results (ug/l)	MDEQ SVOC Results (ug/l)
3	ND (<0.5 ug/l)	ND (<0.05 ug/l)	ND (<10 ug/l)
L-87-3	PCE - 44 TCE - 7.5 cis-1,2-DCE - 12 trans-1,2-DCE - 0.42J	PCE - 60.8 TCE - 7.7 cis-1,2-DCE - 15 trans-1,2-DCE - 0.6	ND (<10 ug/l)
L-87-4	ND (<0.5 ug/l)	ND (<0.05 ug/l)	ND (<10 ug/l)
L-87-7	benzene - 0.45J ethyl benzene - 4.2 xylenes - 2.3 sec-butylbenzene - 4.3 isopropylbenzene - 5.6 naphthalene - 21 n-propylbenzene - 3.4 2-chlorotoluene - 1.2	benzene - 0.6 ethyl benzene - 4.4 xylenes - 2.7 sec-butylbenzene - 5 isopropylbenzene - 6.3 naphthalene - 26 n-propylbenzene - 4.2 2-chlorotoluene - 1.6	fluorene - 7.2J phenanthrene - 4.9J 1-MN - 39 2-MN - 15 naphthalene - 11
L-87-8	PCE - 2.5 TCE - 0.74 cis-1,2-DCE - 0.43J	PCE - 3.1 TCE - 1 cis-1,2-DCE - 0.7 4-IPT - 1 naphthalene - 1.4	fluorene - 5.1J phenanthrene - 1.8J pyrene - 1.8J
L-88-10	PCE - 19 TCE - 8.7 cis-1,2-DCE - 12 vinyl chloride - 0.34J chlorobenzene - 3 1,4-DCB - 0.53	PCE - 21.8 TCE - 7.4 cis-1,2-DCE - 11.8 trans-1,2-DCE - 1.1 chlorobenzene - 3.5 1,4-DCB - 0.7	ND (<10 ug/l)
L-88-13	PCE - 15 TCE - 2.4 cis-1,2-DCE - 1	PCE - 17.1 TCE - 2.8 cis-1,2-DCE - 1.6	ND (<10 ug/l)

**Abbreviations:**

PCE - tetrachloroethene

TCE - trichloroethene

cis-1,2-DCE - cis-1,2-dichloroethene

trans-1,2-DCE - trans-1,2-dichloroethene

1,4-DCB - 1,4-dichlorobenzene

4-IPT - 4-isopropyltoluene

1-MN - 1-methylnaphthalene

2-MN - 2-methylnaphthalene

J - compound detected but below practical quantification limit



**Table 6.0**  
**Natural Attenuation Parameter Results**

Well Location	DO (mg/l)	SO <sub>4</sub> (mg/l)	NO <sub>3</sub> (mg/l)	Fe <sup>2+</sup> (mg/l)	CH <sub>4</sub> (ppm)
<b>Wells in/near plume</b>					
L-87-2	0.75	61	0.66	0.8	1620
L-87-4	2.4	45	0.69	<0.1	50
L-87-7	0.9	20	0.08	0.4	4220
L-87-8	1.6	33	0.26	1.3	180
L-88-10	1.7	48	0.34	<0.1	3
L-88-13	1.25	43	0.37	<0.1	11
95-1	7.2	42	1.02	<0.1	2
<b>Wells away from Plume</b>					
L-87-1	7.85	32	0.5	<0.1	2
L-87-3	8.4	125	3.88	<0.1	2
L-87-5	5.2	63	1.65	<0.1	2
89-2	9.4	60	1.61	<0.1	2
92.3	8.2	42	1.02	<0.1	3
2	NR	48	1.76	<0.1	2





**Table 7.0**

**Apparent Free Product Thickness Measurements  
August 1994 through May 1996  
Livingston Rail Yard, Livingston, Montana**

Well	Aug-94	Nov-94	Feb-95	May-95	Aug-95	Nov-95	May-96	Nov-96	May-97	Ave.
LS-7	0.09	Well abandoned in 12/94								0.09
LB-4	0.48	0.81	0.12	0.45	0.65				0.66	0.53
L-87-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	N/A
L-87-4	0.11		ND	ND	0.19	0.1		0.39	0.98	0.35
L-87-7	0.3	0.68	0.78	0.24	0.65	0.7	0.24	0.46	0.9	0.55
L-87-8	0.43	0.15	1.35	0.12	0.31	0.27	0.11	0.4	0.24	0.38
HRO-6	0.25	0.56	0.63	0.36	0.52		0.65	0.74	0.43	0.52
HRO-7									0.58	N/A
HRO-8		0.21			ND					0.21
HRO-9	0.02		0.06				0.03		0.04	0.04
HRO-10		ND	<0.01		<0.01		ND			N/A
HRO-11		0.11		0.23	ND					0.17
HRO-12	ND	ND	<0.01	ND	ND		ND			N/A
HRO-13	ND	ND	ND	ND	ND		ND			N/A
HRO-14		ND	ND	<0.01			ND			N/A
HRO-15	0.06	0.07	0.07	<0.01						0.07
HRO-16	ND	0.09	0.5	0.04						0.21
HRO-20	ND	<0.01	0.13	ND	0.06	0.16	0.03		ND	0.10
HRO-21	ND	<0.01	<0.01	ND	ND	<0.01	ND		<0.01	N/A
HRO-22	<0.01	<0.01	ND	<0.01	ND	0.01	ND		0.01	0.01
HRO-23	<0.01	<0.01	ND	ND	ND		ND		ND	N/A
HRO-24	ND	0.08	0.14	0.01	0.14	0.24	ND		0.03	0.11
RW-1		<0.01	ND	0.01			ND		ND	0.01
RW-2		<0.01	ND	<0.01			ND		ND	N/A
RW-3		0.04	0.03	<0.01					0.15	0.07
RW-4		0.16	ND	0.16			0.4		0.34	0.27
RW-5		0.09	0.07	0.24						0.13
RW-6		1.07	0.14*	0.22*			0.13		0.36	0.60
RW-7	0.04	0.02	0.4	0.04	0.19	0.25	ND	0.26	0.06	0.16
RW-8	<0.01	0.01	0.02	0.03	0.15	0.17			0.04	0.07
RW-9	ND	ND	ND	ND	ND	0.01	ND	ND	ND	0.01
LG-11							ND			N/A
LG-12							ND			N/A
95-1							ND	ND	ND	N/A
LPZ-100		0.09	0.04							0.07

Notes:

ND - no product detected

<0.01 - trace of product detected but less than resolution  
of product probe

\* - Approximately 35 gallons of product recovered from Well RW-6 during December 1994



## FIGURES



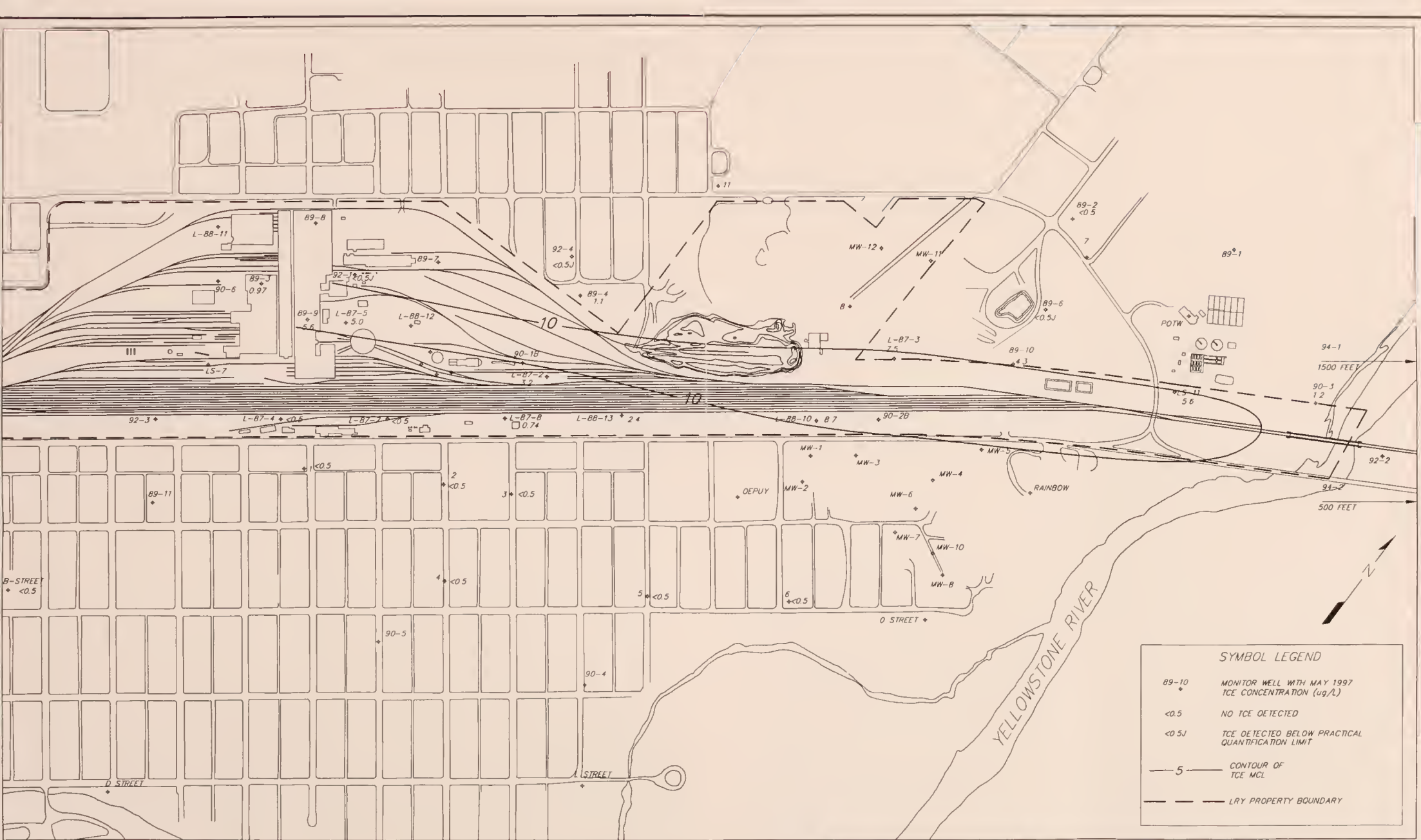












500 0 500  
SCALE IN FEET

BURLINGTON NORTHERN  
SANTA FE RAILROAD COMPANY

ENVIROCON, INC.

1997 ANNUAL  
GROUND WATER REPORT

140101

MAY 1997 TCE  
CONCENTRATIONS

7/31/97

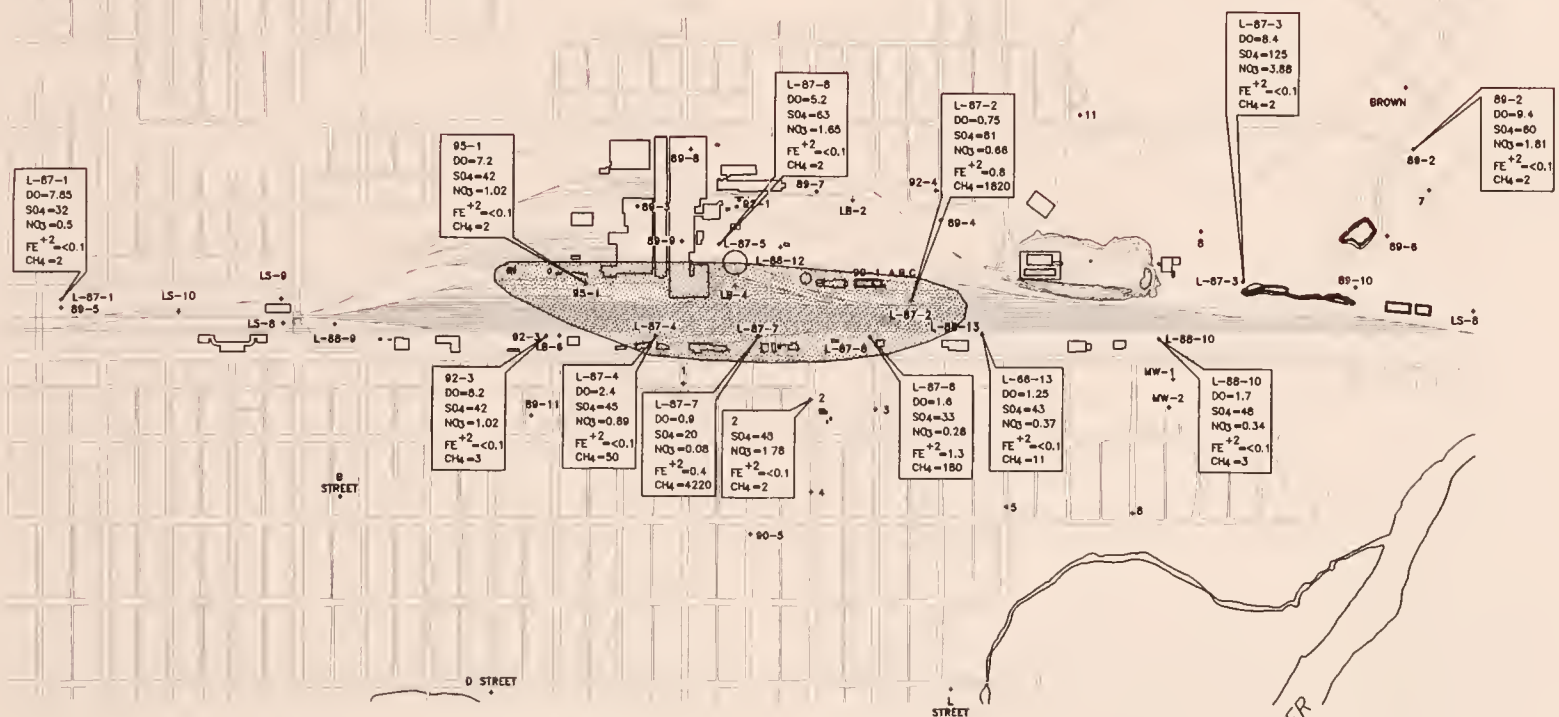
FIGURE 3.0











# SYMBOL LEGEND

- MONITOR, MUNICIPAL OR PRIVATE WELL
- RIVER WATER ELEVATION MEASUREMENT POINT
- DO=8.2 DISSOLVED OXYGEN CONCENTRATION IN mg/l
- SO<sub>4</sub>=42 SULFATE CONCENTRATION IN mg/l
- NO<sub>3</sub>=1.02 NITRATE CONCENTRATION IN mg/l
- FE<sup>+2</sup>=<0.1 FERROUS IRON CONCENTRATION IN mg/l
- CH<sub>4</sub>=2 METHANE CONCENTRATION IN ppm
- APPROXIMATE AERIAL EXTENT OF FREE & RESIDUAL PRODUCT PLUME

BURLINGTON NORTHERN  
SANTA FE RAILROAD COMPANY

ENVIROCON, INC.

1997 ANNUAL  
GROUND WATER REPORT

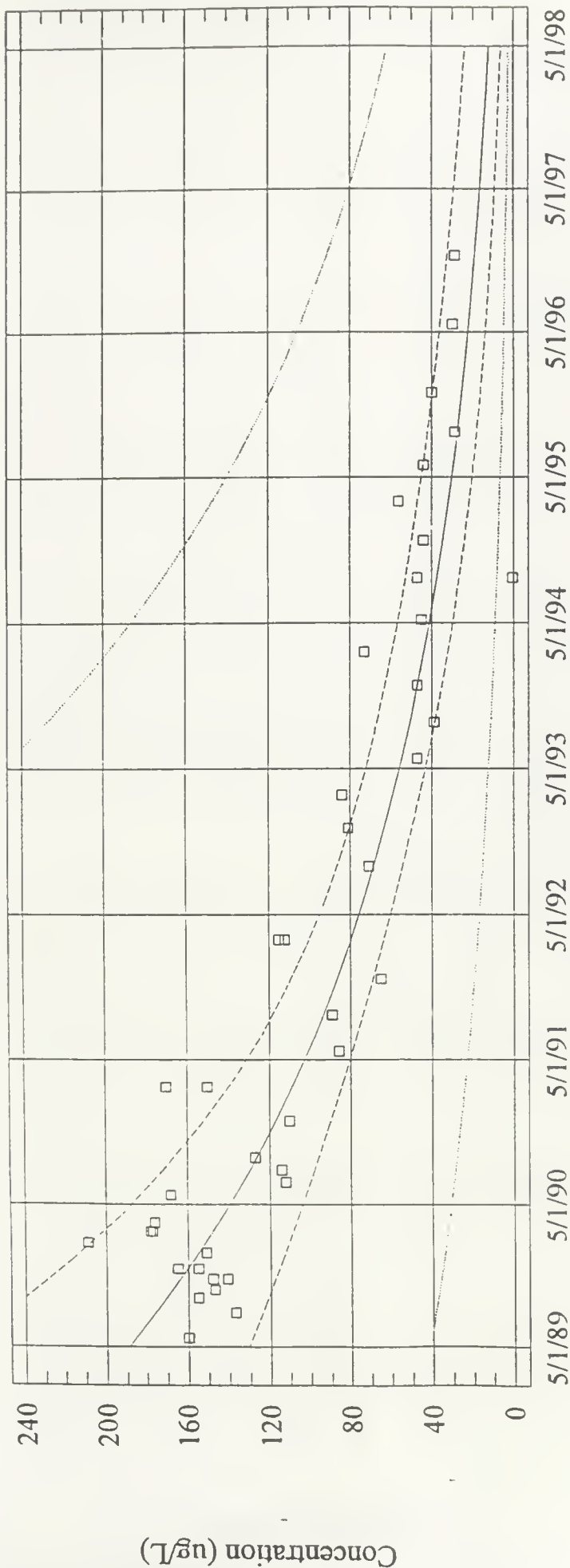
NATURAL ATTENUATION  
PARAMETER RESULTS

140101

7/31/97 FIGURE 5.0







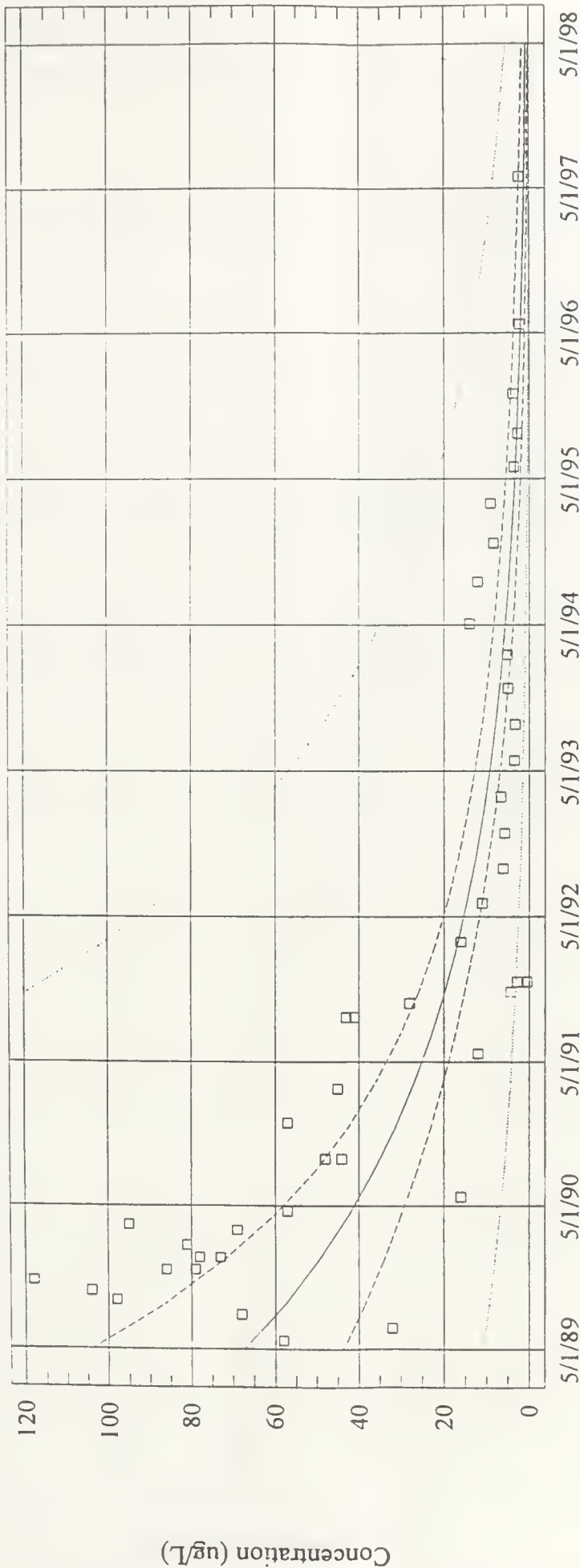
EXPONENTIAL REGRESSION LINE WITH  
95% CONFIDENCE INTERVAL ENVELOPE  
AVERAGE SLOPE IN ug/L/YEAR = 21.5  
% DECLINE OBSERVED = 91.0%  
CORRELATION COEFFICIENT = -0.81

ESTIMATED TIME FRAME  
FOR COMPLIANCE  
WITH MOL LEVELS  
BETWEEN YEARS  
1998 - 2008

BURLINGTON NORTHERN SANTA FE RAILROAD COMPANY	1997 ANNUAL GROUNDWATER REPORT LIVINGSTON RAIL YARD LIVINGSTON, MONTANA	TETRACHLOROETHENE CONCENTRATIONS FOR WELL L-88-10	
		8/1/97	FIGURE 6.0

AutoCad FILE: PCCL8810.DWG





EXPONENTIAL REGRESSION LINE WITH  
95% CONFIDENCE INTERVAL ENVELOPE  
AVERAGE SLOPE IN ug/L/YEAR = 7.7  
% DECLINE OBSERVED = 99.3%  
CORRELATION COEFFICIENT = -0.78

ESTIMATED TIME FRAME  
FOR COMPLIANCE  
WITH MCL LEVELS  
BETWEEN YEARS  
1993 - 1995

BURLINGTON NORTHERN  
SANTA FE RAILROAD COMPANY

ENVIROCON, INC.

1997 ANNUAL  
GROUNDWATER REPORT  
LIVINGSTON RAIL YARD  
LIVINGSTON, MONTANA

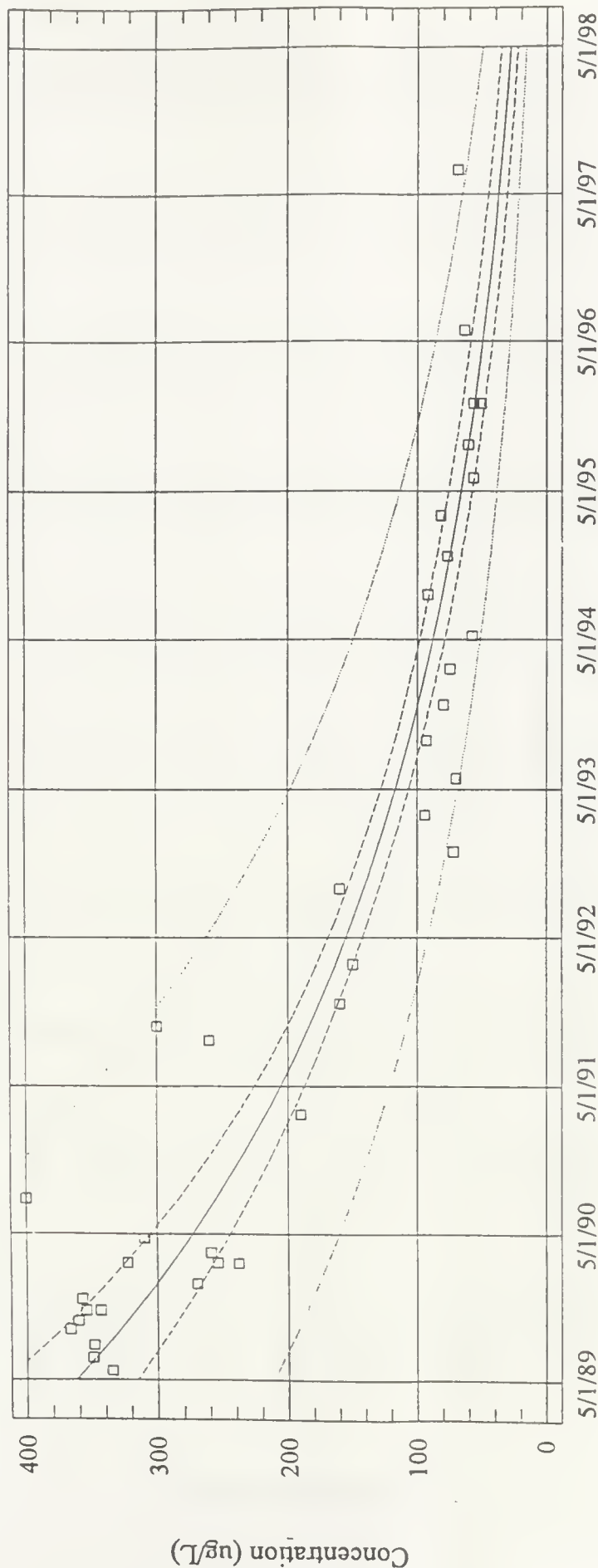
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TETRACHLOROETHENE  
CONCENTRATIONS  
FOR WELL L-87-8

8/1/97

FIGURE 7.0





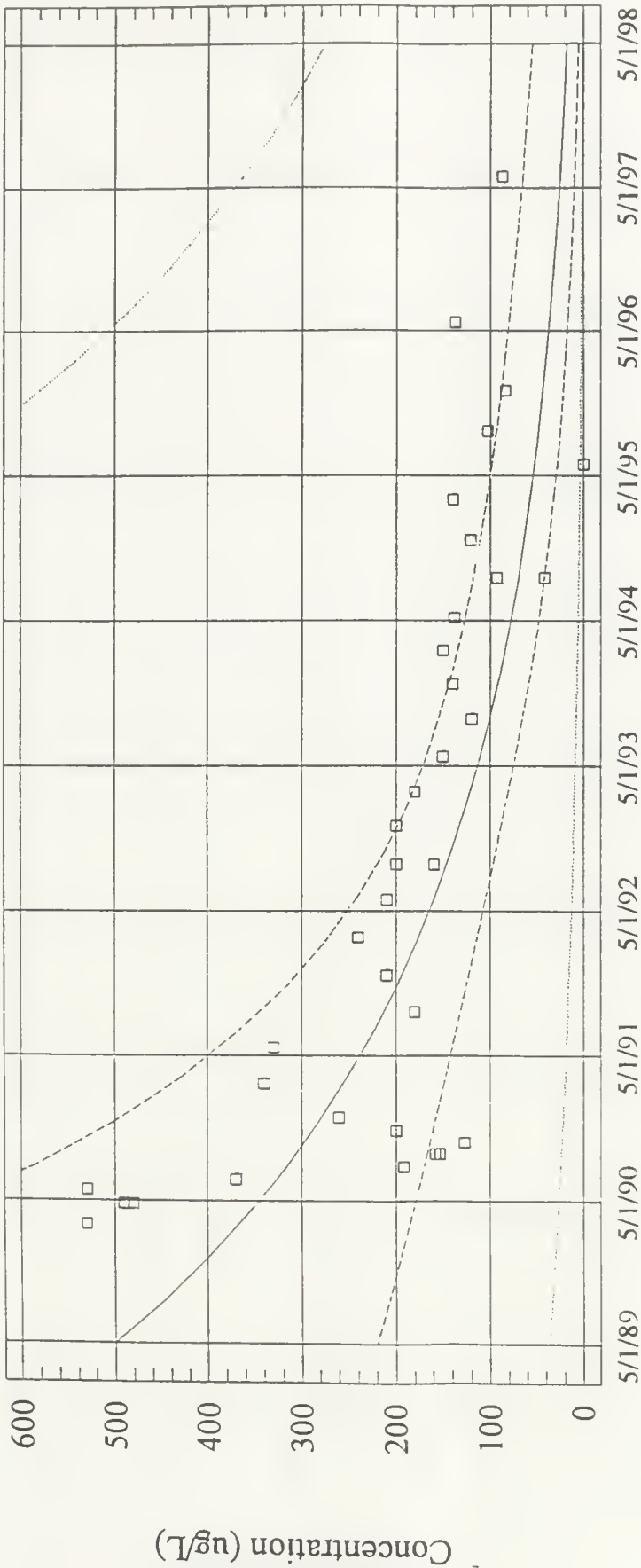
EXPONENTIAL REGRESSION LINE WITH  
95% CONFIDENCE INTERVAL ENVELOPE  
AVERAGE SLOPE IN ug/L/YEAR = 37.1  
% DECLINE OBSERVED = 92.3%  
CORRELATION COEFFICIENT = -0.94

ESTIMATED TIME FRAME  
FOR COMPLIANCE  
WITH MCL LEVELS  
BETWEEN YEARS  
2001 - 2005

BURLINGTON NORTHERN SANTA FE RAILROAD COMPANY	1997 ANNUAL GROUNDWATER REPORT LIVINGSTON RAIL YARD LIVINGSTON, MONTANA	TETRACHLOROETHENE CONCENTRATIONS FOR WELL L-87-5
ENVIROCON, INC.	AutoCad FILE: PCEL875.DWG	8/1/97
		FIGURE 8.0







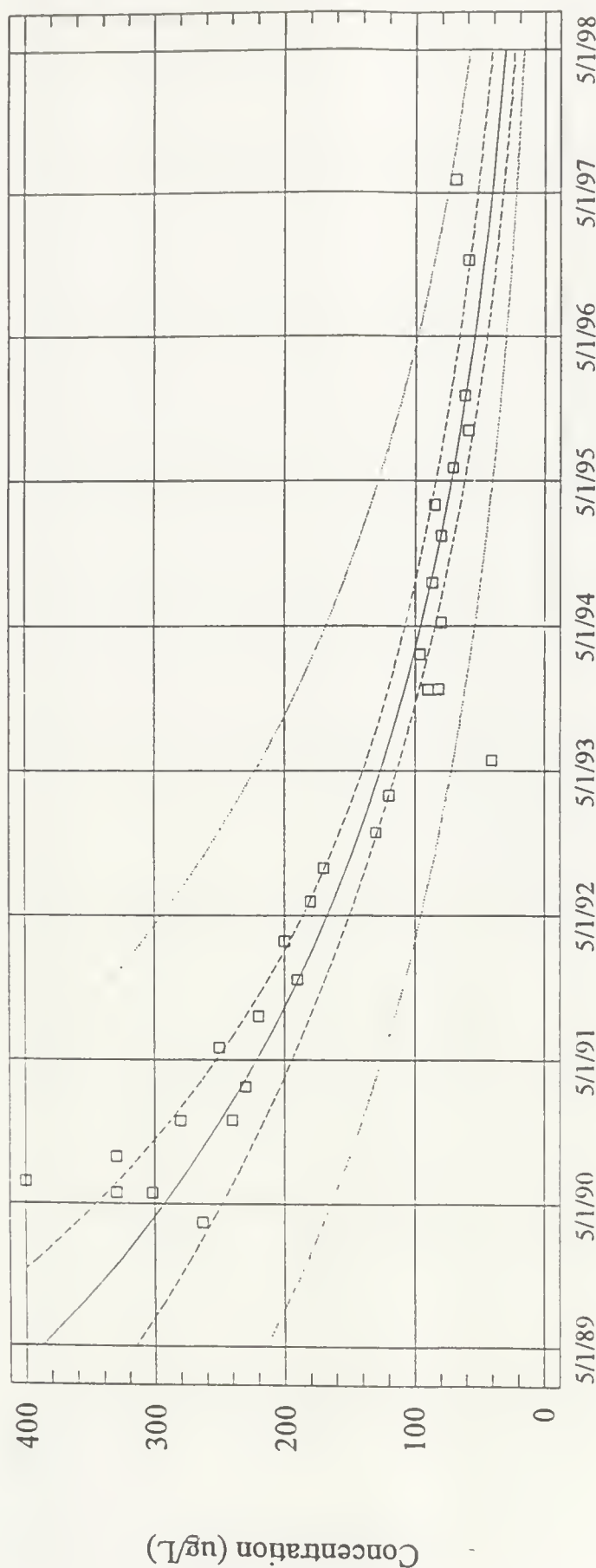
EXPONENTIAL REGRESSION LINE WITH  
95% CONFIDENCE INTERVAL ENVELOPE  
AVERAGE SLOPE IN ug/L/YEAR = 53.4  
% DECLINE OBSERVED = 96.2%  
CORRELATION COEFFICIENT = -0.54

ESTIMATED TIME FRAME  
FOR COMPLIANCE  
WITH MCL LEVELS  
BETWEEN YEARS  
1997 - 2007

BURLINGTON NORTHERN SANTA FE RAILROAD COMPANY	1997 ANNUAL GROUNDWATER REPORT LIVINGSTON RAIL YARD LIVINGSTON, MONTANA		TETRACHLOROETHENE CONCENTRATIONS FOR WELL 89-4	
	AutoCad FILE: PCE894.DWG		8/1/97	FIGURE 9.0

ENVIROCON, INC.





EXPONENTIAL REGRESSION LINE WITH  
 95% CONFIDENCE INTERVAL ENVELOPE  
 AVERAGE SLOPE IN ug/L/YEAR = 39.6  
 % DECLINE OBSERVED = 91.8%  
 CORRELATION COEFFICIENT = -0.91

NO SAMPLE COLLECTED MAY '96

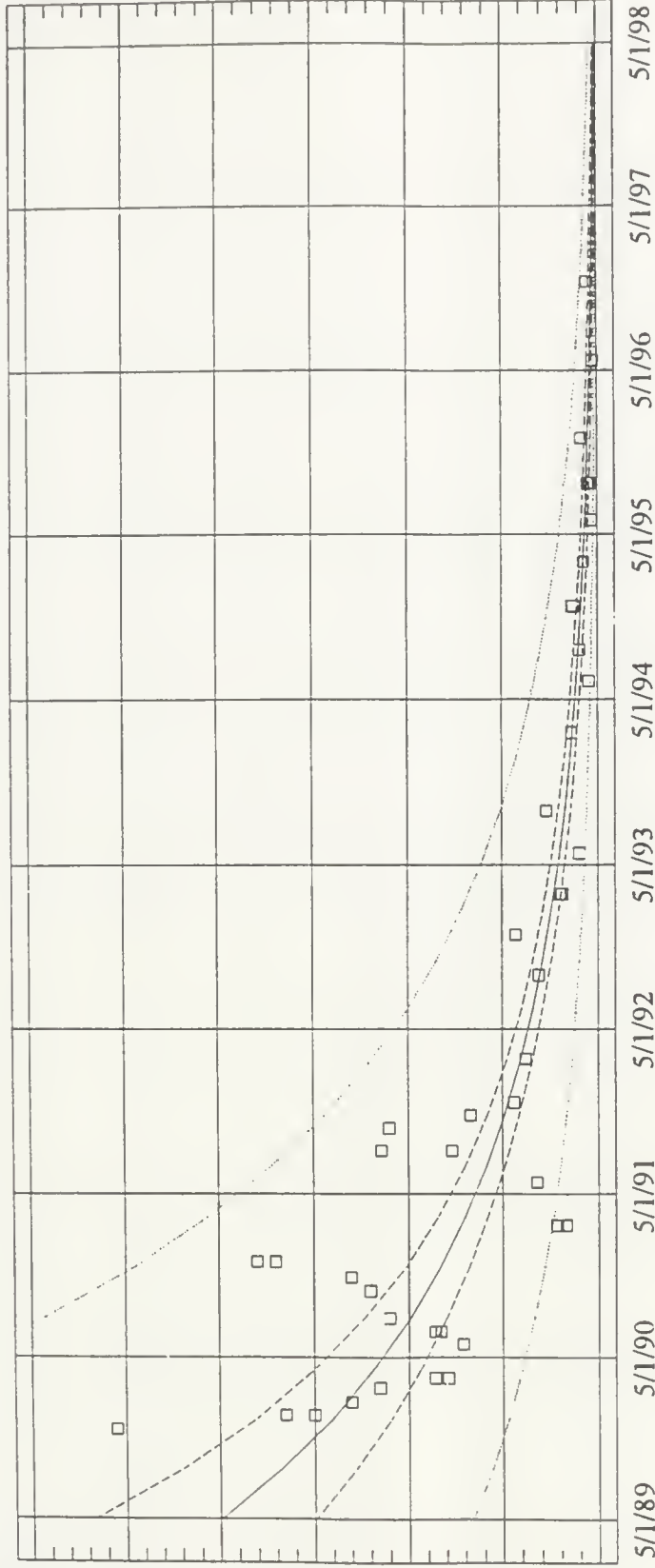
ESTIMATED TIME FRAME  
 FOR COMPLIANCE  
 WITH MCL LEVELS  
 BETWEEN YEARS  
 2001 - 2006

BURLINGTON NORTHERN SANTA FE RAILROAD COMPANY	1997 ANNUAL GROUNDWATER REPORT LIVINGSTON RAIL YARD LIVINGSTON, MONTANA AutoCad FILE: PCc899.DWG	TETRACHLOROETHENE CONCENTRATIONS FOR WELL 89-9
ENVIROCON, INC.	8/1/97	FIGURE 10.0



(X 1000)

Concentration (ug/L)



EXPONENTIAL REGRESSION LINE WITH  
95% CONFIDENCE INTERVAL ENVELOPE  
AVERAGE SLOPE IN ug/L/YEAR = 222.2  
% DECLINE OBSERVED = 100.0%  
CORRELATION COEFFICIENT = -0.91

ESTIMATED TIME FRAME  
FOR COMPLIANCE  
WITH MCL LEVELS  
BETWEEN YEARS  
1995 - 1996

BURLINGTON NORTHERN  
SANTA FE RAILROAD COMPANY

ENVIROCON, INC.

1997 ANNUAL  
GROUNDWATER REPORT  
LIVINGSTON RAIL YARD  
LIVINGSTON, MONTANA

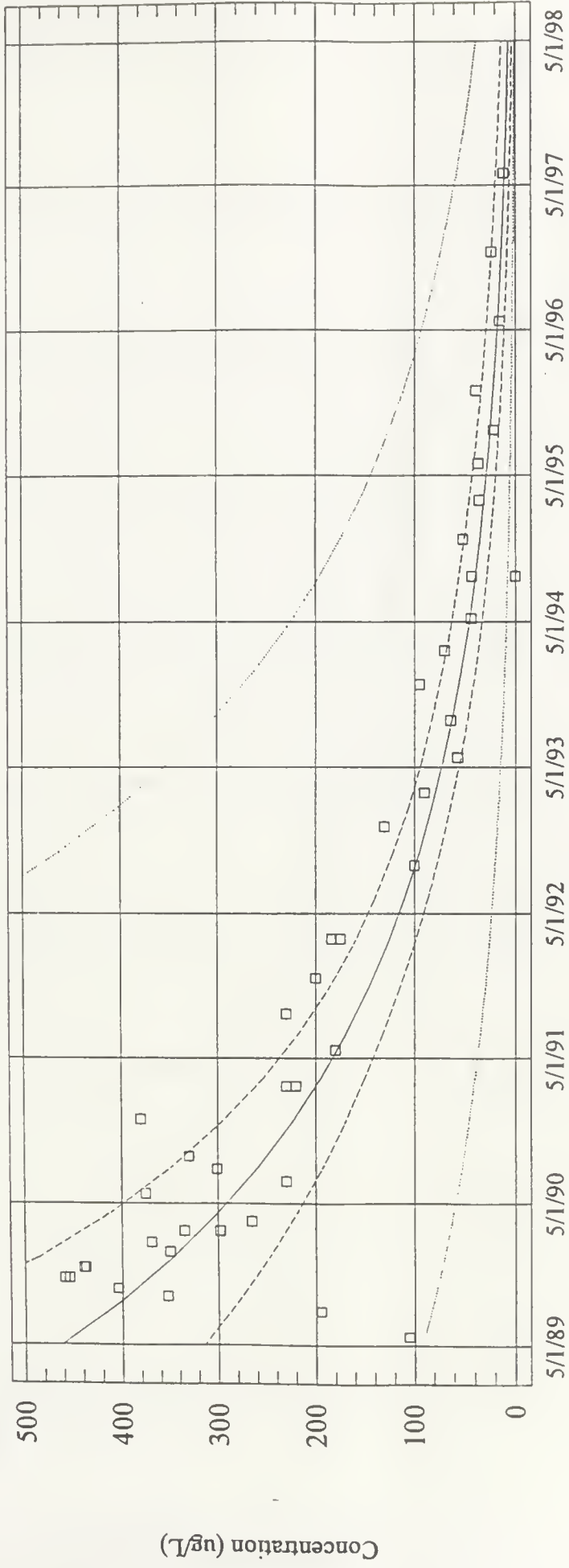
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cis-1,2 DICHLOROETHENE  
CONCENTRATIONS  
FOR WELL L-87-2

8/1/97

FIGURE 11.0





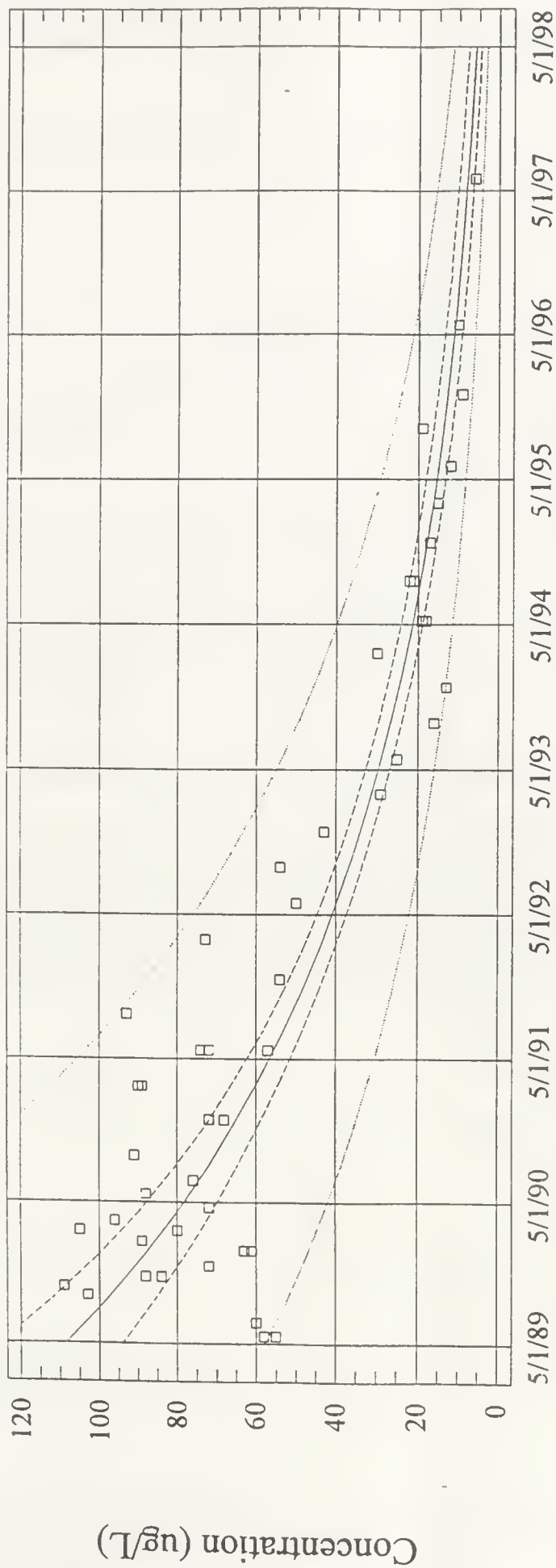
EXPONENTIAL REGRESSION LINE WITH  
 95% CONFIDENCE INTERVAL ENVELOPE  
 AVERAGE SLOPE IN ug/L/YEAR = 50.0  
 % DECLINE OBSERVED = 97.8%  
 CORRELATION COEFFICIENT = -0.91

ESTIMATED TIME FRAME  
 FOR COMPLIANCE  
 WITH MCL LEVELS  
 BETWEEN YEARS  
 1992 - 1994

BURLINGTON NORTHERN SANTA FE RAILROAD COMPANY	1997 ANNUAL GROUNDWATER REPORT LIVINGSTON RAIL YARD LIVINGSTON, MONTANA	cis-1,2 DICHLOROETHENE CONCENTRATIONS FOR WELL L-88-10
ENVIROCON, INC.	AutoCad FILE: DCEL8810.DWG	8/1/97
		FIGURE 12.0





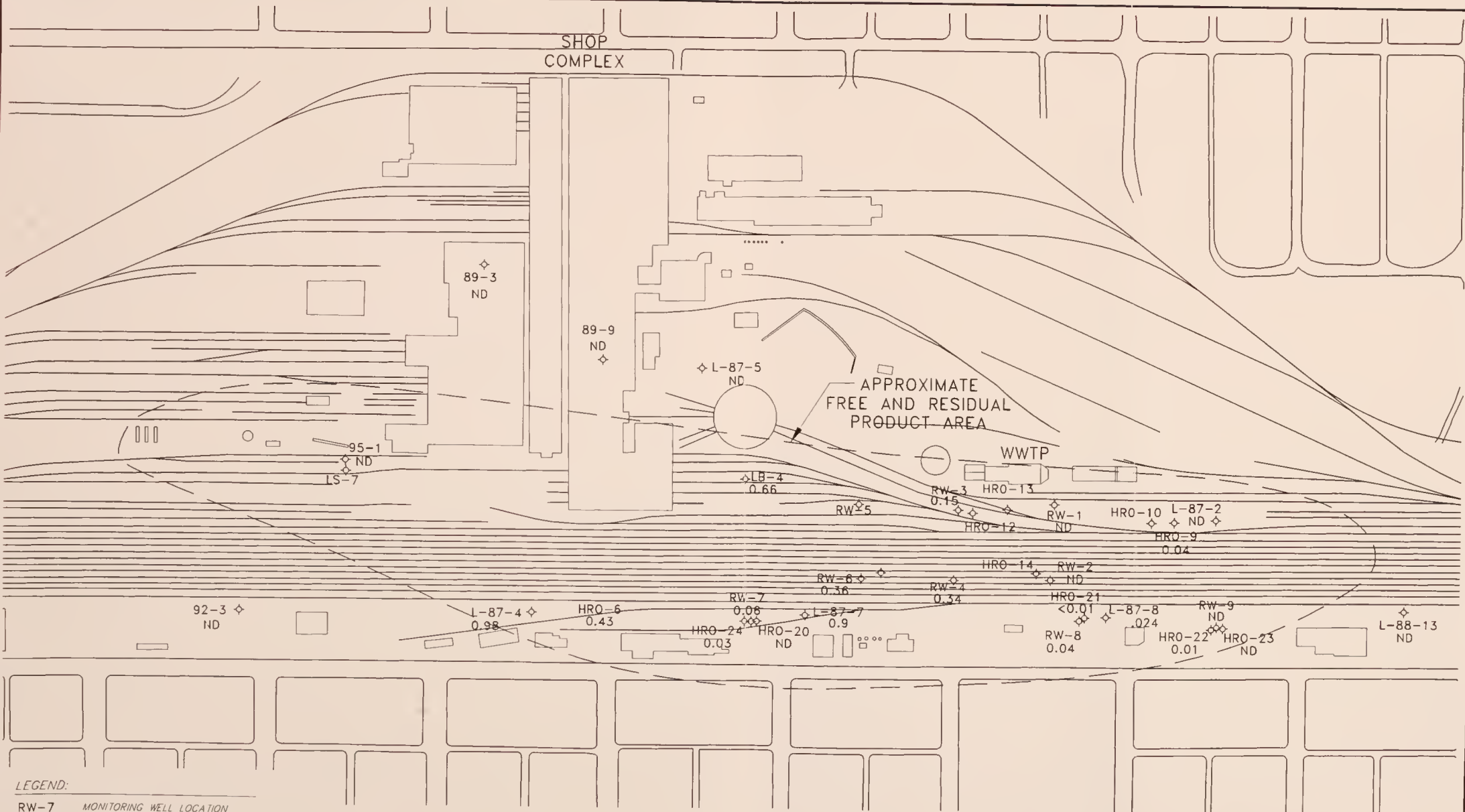


EXPONENTIAL REGRESSION LINE WITH  
95% CONFIDENCE INTERVAL ENVELOPE  
AVERAGE SLOPE IN ug/L/YEAR = 11.3  
% DECLINE OBSERVED = 94.4%  
CORRELATION COEFFICIENT = -0.92

ESTIMATED TIME FRAME  
FOR COMPLIANCE  
WITH MCL LEVELS  
BETWEEN YEARS  
1990 - 1991

BURLINGTON NORTHERN SANTA FE RAILROAD COMPANY		1997 ANNUAL GROUNDWATER REPORT LIVINGSTON RAIL YARD LIVINGSTON, MONTANA		cis-1,2 DICHLOROETHENE CONCENTRATIONS FOR WELL LS-11	
ENVIROCON, INC.		AutoCad FILE: DCELS11.DWG		8/1/97	
				FIGURE 13.0	





LEGEND:

RW-7  
0.04  
◇  
MONITORING WELL LOCATION  
W/APPEARANT FREE PRODUCT  
THICKNESS MEASUREMENTS

ND  
NO PRODUCT DETECTED

<0.01  
TRACE OF PRODUCT DETECTED  
BUT LESS THAN RESOLUTION  
OF PRODUCT PROBE



BURLINGTON NORTHERN SANTA FE RAILROAD COMPANY	1997 ANNUAL GROUND WATER REPORT	MAY 1997 APPARENT FREE PRODUCT THICKNESS MEASUREMENTS	
ENVIROCON, INC.	140101.F02	7/31/97	FIGURE 14.0



## **APPENDIX A**

### **LABORATORY ANALYTICAL RESULTS**





**NOVEMBER 1996**

**BNSF GROUND WATER RESULTS**



**ENERGY LABORATORIES, INC.**P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325  
FAX (406) 252-6069 • 1-800-735-4489

Client: Envirocon, Inc.

Date Sampled: 27-MAY-97

Date Received: 29-MAY-97

Analysis Date: 04-JUN-1997 14:26

File: /chem/IONTRAP2.i/vc060497.b/9732728a.d

Project Info: LRY/BN

Sample Info: 140101-1541 Well # 4

Lab No.: 97-32728

Report Date: 06/10/97 09:11

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624****VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.4	104	80--120
Toluene d8	10.0	9.70	97	80--120
p-Bromofluorobenzene	10.0	10.7	107	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: THC Reviewing Supervisor: nm

**ENERGY LABORATORIES, INC.**P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325  
FAX (406) 252-6069 • 1-800-735-4489

Client: Envirocon, Inc.

Date Sampled: 27-MAY-97

Date Received: 29-MAY-97

Analysis Date: 09-JUN-1997 17:13

File: /chem/IONTRAP2.1/vc060997.b/9732728b.d

Project Info: LRY/BN

Sample Info: 140101-1541

*Well #4 Lab dup*  
**EPA METHOD 624**

Lab No.: 97-32728 Duplicate

Report Date: 06/10/97 08:59

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.76	98	80--120
Toluene d8	10.0	9.26	93	80--120
p-Bromofluorobenzene	10.0	10.1	101	80--120

## QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJCReviewing Supervisor: MMB

**ENERGY LABORATORIES, INC.**P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325  
FAX (406) 252-6069 • 1-800-735-4489

Client: Envirocon, Inc.

Date Sampled: 27-MAY-97

Date Received: 29-MAY-97

Analysis Date: 04-JUN-1997 15:25

File: /chem/IONTRAP2.1/vc060497.b/9732729a.d

Project Info: LRY/BN

Sample Info: 140101-1542

Lab No.: 97-32729

Report Date: 06/10/97 09:11

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624****VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.3	103	80--120
Toluene d8	10.0	10.3	103	80--120
p-Bromofluorobenzene	10.0	10.7	107	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJc Reviewing Supervisor: AMJ



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Client: Envirocon, Inc.

Date Sampled: 27-MAY-97

Date Received: 29-MAY-97

Analysis Date: 04-JUN-1997 16:22

File: /chem/IONTRAP2.i/vc060497.b/9732730a.d

Project Info: LRY/BN

Sample Info: 140101-1543 *Trip Blank*

Lab No.: 97-32730

Report Date: 06/10/97 09:11

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

EPA METHOD 624

**VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
<b>Chloroform</b>	<b>67-66-3</b>	<b>0.55</b>	
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.5	105	80--120
Toluene d8	10.0	9.35	94	80--120
p-Bromofluorobenzene	10.0	10.9	109	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: nmj

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Client: Envirocon, Inc.  
Date Sampled: 27-MAY-97  
Date Received: 29-MAY-97  
Analysis Date: 04-JUN-1997 17:27  
File: /chem/IONTRAP2.i/vc060497.b/9732731a.d  
Project Info: LRY/BN  
Sample Info: 140101-1544 *Well #6*

Lab No.: 97-32731  
Report Date: 06/10/97 09:11  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

EPA METHOD 624  
**VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

----- **SURROGATE RECOVERY REPORT** -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	11.0	110	80--120
Toluene d8	10.0	10.1	101	80--120
p-Bromofluorobenzene	10.0	10.9	109	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJC      Reviewing Supervisor: AMB



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Client: Envirocon, Inc.

Date Sampled: 28-MAY-97

Date Received: 29-MAY-97

Analysis Date: 09-JUN-1997 15:59

File: /chem/IONTRAP2.1/vc060997.b/9732732b.d

Project Info: LRY/BN

Sample Info: 140101-1545 Well #1

Lab No.: 97-32732

Report Date: 06/10/97 09:51

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

## EPA METHOD 624

## VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

## ----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.87	89	80--120
Toluene d8	10.0	10.6	106	80--120
p-Bromofluorobenzene	10.0	11.0	110	80--120

## QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: Hjc Reviewing Supervisor: AM

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FAX (406) 252-6069 • 1-800-735-4489

Client: Envirocon, Inc.

Date Sampled: 28-MAY-97

Date Received: 29-MAY-97

Analysis Date: 04-JUN-1997 18:28

File: /chem/IONTRAP2.i/vc060497.b/9732733a.d

Project Info: LRY/BN

Sample Info: 140101-1546

Lab No.: 97-32733

Report Date: 06/10/97 09:11

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	3.4	
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	4.0	
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	5.9	
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	25	D
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	5.6	
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	0.31J
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.5	105	80--120
Toluene d8	10.0	9.90	99	80--120
p-Bromofluorobenzene	10.0	10.9	109	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

D= Value was derived from a 10 times dilution.

J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: Hjc Reviewing Supervisor: my

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FAX (406) 252-6069 • 1-800-735-4489

Client: Envirocon, Inc.

Date Sampled: 28-MAY-97

Date Received: 29-MAY-97

Analysis Date: 04-JUN-1997 19:30

File: /chem/IONTRAP2.i/vc060497.b/9732734a.d

Project Info: LRY/BN

Sample Info: 140101-1547 90-3

Lab No.: 97-32734

Report Date: 06/10/97 09:12

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	0.38J
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	11	D
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	1.2	
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.5	105	80--120
Toluene d8	10.0	10.2	102	80--120
p-Bromofluorobenzene	10.0	10.8	108	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

D= Value was derived from a 10 times dilution.

J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: MT



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Client: Envirocon, Inc.

Date Sampled: 28-MAY-97

Date Received: 29-MAY-97

Analysis Date: 06-JUN-1997 17:39

File: /chem/IONTRAP2.i/vc060697.b/9732735a.d

Project Info: LRY/BN

Sample Info: 140101-1548

89-6

Lab No.: 97-32735

Report Date: 06/10/97 10:32

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624****VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-6-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
<b>Tetrachloroethene</b>	<b>127-18-4</b>	<b>12</b>	
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
<b>Trichloroethene</b>	<b>79-01-6</b>	<b>&lt;0.50</b>	<b>0.18J</b>
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.92	99	80--120
Toluene d8	10.0	9.77	98	80--120
p-Bromofluorobenzene	10.0	9.91	99	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: Hjc      Reviewing Supervisor: mtb

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FAX (406) 252-6069 • 1-800-735-4489

Client: Envirocon, Inc.

Date Sampled: 28-MAY-97

Date Received: 29-MAY-97

Analysis Date: 06-JUN-1997 18:28

File: /chem/IONTRAP2.i/vc060697.b/9732736a.d

Project Info: LRY/BN

Sample Info: 140101-1549

Lab No.: 97-32736

Report Date: 06/10/97 10:33

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

89-6 Duplicate (field)  
EPA METHOD 624**VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-05-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
<b>Tetrachloroethene</b>	<b>127-18-4</b>	<b>13</b>	
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
<b>Trichloroethene</b>	<b>79-01-6</b>	<b>&lt;0.50</b>	<b>0.18J</b>
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.8	108	80--120
Toluene d8	10.0	10.4	104	80--120
p-Bromofluorobenzene	10.0	10.1	101	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: HJCReviewing Supervisor: mm

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FAX (406) 252-6069 • 1-800-735-4489

Client: Envirocon, Inc.  
Date Sampled: 28-MAY-97  
Date Received: 29-MAY-97  
Analysis Date: 06-JUN-1997 19:20  
File: /chem/IONTRAP2.1/vc060697.b/9732737a.d  
Project Info: LRY/BN  
Sample Info: 140101-1550 **89-10**

Lab No.: 97-32737  
Report Date: 06/10/97 10:33  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

**EPA METHOD 624**  
**VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethane	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	4.2	
trans-1,2-Dichloroethene	156-60-5	<0.50	0.19J
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	35	D
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	4.3	
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

----- **SURROGATE RECOVERY REPORT** -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.6	106	80--120
Toluene d8	10.0	8.93	89	80--120
p-Bromofluorobenzene	10.0	10.2	102	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

- U= Indicates compound was analyzed for but not detected.
- D= Value was derived from a 10 times dilution.
- J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: Hjc      Reviewing Supervisor: mm



Quality Control Sample: Laboratory Reagent Blank 04-JUN-1997 08:53

Report Date: 06/10/97 09:06

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /chem/IONTRAP2.i/vc060497.b/blk0604a.d

Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT

=====

COMPOUNDS	CAS NO.	CONCENTRATION UNITS = ug/L (ppb)	RESULT	QUALIFIER
=====	=====		=====	=====
Carbon Tetrachloride	56-23-5		<0.50	U
Chlorobenzene	108-90-7		<0.50	U
1,2-Dichlorobenzene	95-50-1		<0.50	U
1,4-Dichlorobenzene	106-46-7		<0.50	U
1,2-Dichloroethane	107-06-2		<0.50	U
1,1-Dichloroethene	75-35-4		<0.50	U
cis-1,2-Dichloroethene	156-59-2		<0.50	U
trans-1,2-Dichloroethene	156-60-5		<0.50	U
1,2-Dichloropropane	78-87-5		<0.50	U
Methylene Chloride	75-09-2		<0.50	U
Tetrachloroethene	127-18-4		<0.50	U
1,1,1-Trichloroethane	71-55-6		<0.50	U
1,1,2-Trichloroethane	79-00-5		<0.50	U
Trichloroethene	79-01-6		<0.50	U
Vinyl Chloride	75-01-4		<0.50	U
2-Chloroethylvinyl ether	110-75-8		<0.50	U
Bromodichloromethane	75-27-4		<0.50	U
Bromoform	75-25-2		<0.50	U
Chlorodibromomethane	124-48-1		<0.50	U
Chloroform	67-66-3		<0.50	U
Bromomethane	74-83-9		<0.50	U
Chloroethane	75-00-3		<0.50	U
Chloromethane	74-87-3		<0.50	U
2-Chlorotoluene	95-49-8		<0.50	U
1,3-Dichlorobenzene	541-73-1		<0.50	U
Dichlorodifluoromethane	75-71-8		<0.50	U
1,1-Dichloroethane	75-34-3		<0.50	U
cis-1,3-Dichloropropene	10061-01-5		<0.50	U
trans-1,3-Dichloropropene	10061-02-6		<0.50	U
Fluorotrichloromethane	75-69-4		<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5		<0.50	U

----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.96	100	80--120
Toluene d8	10.0	9.25	92	80--120
p-Bromofluorobenzene	10.0	10.4	104	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: MM



Quality Control Sample: Laboratory Reagent Blank 06-JUN-1997 12:36

Report Date: 06/10/97 10:58

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /chem/IONTRAP2.1/vc060697.b/blk0606a.d

Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT  
=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.76	98	80--120
Toluene d8	10.0	10.2	102	80--120
p-Bromofluorobenzene	10.0	10.3	103	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJC      Reviewing Supervisor: MB

Quality Control Sample: Laboratory Reagent Blank 09-JUN-97 15:14

Report Date: 06/09/97 15:47

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /chem/IONTRAP2.i/vc060997.b/blk0609b.d

Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT

=====

COMPOUNDS	CAS NO.	CONCENTRATION UNITS = ug/L (ppb)	RESULT	QUALIFIER
=====	=====		=====	=====
Carbon Tetrachloride	56-23-5		<0.50	U
Chlorobenzene	108-90-7		<0.50	U
1,2-Dichlorobenzene	95-50-1		<0.50	U
1,4-Dichlorobenzene	106-46-7		<0.50	U
1,2-Dichloroethane	107-06-2		<0.50	U
1,1-Dichloroethene	75-35-4		<0.50	U
cis-1,2-Dichloroethene	156-59-2		<0.50	U
trans-1,2-Dichloroethene	156-60-5		<0.50	U
1,2-Dichloropropane	78-87-5		<0.50	U
Methylene Chloride	75-09-2		<0.50	U
Tetrachloroethene	127-18-4		<0.50	U
1,1,1-Trichloroethane	71-55-6		<0.50	U
1,1,2-Trichloroethane	79-00-5		<0.50	U
Trichloroethene	79-01-6		<0.50	U
Vinyl Chloride	75-01-4		<0.50	U
2-Chloroethylvinyl ether	110-75-8		<0.50	U
Bromodichloromethane	75-27-4		<0.50	U
Bromoform	75-25-2		<0.50	U
Chlorodibromomethane	124-48-1		<0.50	U
Chloroform	67-66-3		<0.50	U
Bromomethane	74-83-9		<0.50	U
Chloroethane	75-00-3		<0.50	U
Chloromethane	74-87-3		<0.50	U
2-Chlorotoluene	95-49-8		<0.50	U
1,3-Dichlorobenzene	541-73-1		<0.50	U
Dichlorodifluoromethane	75-71-8		<0.50	U
1,1-Dichloroethane	75-34-3		<0.50	U
cis-1,3-Dichloropropene	10061-01-5		<0.50	U
trans-1,3-Dichloropropene	10061-02-6		<0.50	U
Fluorotrichloromethane	75-69-4		<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5		<0.50	U

----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.80	88	80--120
Toluene d8	10.0	10.0	100	80--120
p-Bromofluorobenzene	10.0	11.0	110	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: Hjc Reviewing Supervisor: MB

# EPA METHOD 624 BLANK SPIKE REPORT

=====

Quality Control Sample: Certified Reference Sample Analysis 05-JUN-1997 19:04

Report Date: 06/10/97 09:47

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /chem/IONTRAP2.i/vc060597.b/qcs0605b.d

Remarks: This certified reference sample was spiked into a blank sample matrix then extracted and analyzed with your set of samples to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate results.

CONCENTRATION UNITS = ug/L (ppb)

Spike Compound	Added	Measured	%Rec	QC Limits
=====	=====	=====	=====	=====
Carbon Tetrachloride	5.00	4.80	96	60--140
Chlorobenzene	5.00	5.16	103	60--140
1,4-Dichlorobenzene	5.00	5.35	107	60--140
1,2-Dichloroethane	5.00	5.05	101	60--140
1,1-Dichloroethene	5.00	4.74	95	60--140
trans-1,2-Dichloroethene	5.00	4.77	95	60--140
1,2-Dichloropropane	5.00	4.56	91	60--140
Tetrachloroethene	5.00	4.81	96	60--140
1,1,2-Trichloroethane	5.00	5.15	103	60--140
1,3-Dichlorobenzene	5.00	5.31	106	60--140

## SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.4	104	80--120
Toluene d8	10.0	10.2	102	80--120
p-Bromofluorobenzene	10.0	9.90	99	80--120

REPORT COMMENTS: None

Analyst: Hjc      Reviewing Supervisor: MTJ

# EPA METHOD 624 MATRIX SPIKE REPORT

=====

Quality Control Sample: Matrix Spike Analysis 09-JUN-97 17:58

Lab No.: 97-32729

Report Date: 06/10/97 07:14

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /chem/IONTRAP2.i/vc060997.b/9732729s.d

Remarks: These compounds were spiked into the sample matrix to determine if the sample matrix contributes bias to the analytical results and to monitor the accuracy of the methodology.

CONCENTRATION UNITS = ug/L (ppb)

Spike Compound	Spike Added	Sample Concentration	Matrix Spike Concentration	MS %Rec	QC Limits
Chlorobenzene	5.00	<0.500	4.99	100	60--140
1,1-Dichloroethene	5.00	<0.500	4.83	97	60--140
Trichloroethene	5.00	<0.500	5.43	109	60--140

Lab Nos.: 97-32728 - 97-32737

Date: 29-MAY-97

Received by: Randa Hoelscher

Logged In by: Randa Hoelscher

### SAMPLE CONDITION QA/QC REPORT

This report provides information about the condition of the sample(s)  
and associated sample custody information on receipt at the laboratory.

Chain of Custody Form Completed & Signed	<u>Yes</u>	Comments: _____
Chain of Custody Seal	<u>No</u>	Comments: _____
Intact	<u>N/A</u>	Comments: _____
Signature Match Chain of Custody vs. Seal	<u>N/A</u>	Comments: _____
Samples Received Cold	<u>Yes</u>	Comments: _____
Samples Received Within Holding Time	<u>Yes</u>	Comments: _____
Samples Received in Proper Containers	<u>Yes</u>	Comments: _____
Samples Received Properly Preserved	<u>N/A</u>	Comments: _____

Samples requiring analysis for volatile organics are tested for proper preservation at the time of analysis.  
Any preservation problems encountered for these samples are noted on the analytical parameter report pages.

Client notified about sample discrepancies:

Who: \_\_\_\_\_ By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Method of Shipping: Greyhound 150 736 640 0

Additional comments: \_\_\_\_\_



## CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME		NO. OF CONTAINERS		REMARKS	
140101		LRY/BN		109			
SAMPLERS: (Signature) <i>Michael McKenney</i>							
SAMPLED VOLUME	DATE	TIME	COMP.	GRAB	SAMPLE NUMBER		
2 - 40ml	5/27/97				140101 - 1541	X	
					- 1542	X	
					- 1543	X	
					- 1544	X	
					- 1545	X	
					- 1546	X	
					- 1547	X	
					- 1548	X	
					- 1549	X	
					- 1550	X	
Please FAX results to: Attn: Mike McKenney 406-543-7987							
Relinquished (Signature)		Date/Time		Received by: (Signature)		Received by: (Signature)	
<i>Michael McKenney</i>		5/27/97 845					
Relinquished (Signature)		Date/Time		Received by: (Signature)		Received by: (Signature)	
Chain of Custody Seal				Remarks			
Intact? (yes/no) <i>The Seal</i>				Lab Personnel (receiving) Signature: <i>Michael McKenney</i> 05/29/97 10:15:30			
				Split Samples: <input type="checkbox"/> Accepted <input type="checkbox"/> Declined			
				Signature			



**ENERGY LABORATORIES, INC.**


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FAX (406) 252-6069 • 1-800-735-4489

June 23, 1997

Mike McKinsey  
Envirocon, Inc.  
P.O. Box 8243  
Missoula, MT 59807

On May 31, 1997, these samples, represented by our laboratory numbers 97-33048 through 97-33060, were submitted to our laboratory for analysis.

The test results and quality assurance were reviewed and approved by the undersigned.

Reviewed by: 



**ENERGY LABORATORIES, INC.**P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325  
FAX (406) 252-6069 • 1-800-735-4489

Client: Envirocon, Inc.  
Date Sampled: 29-MAY-97  
Date Received: 31-MAY-97  
Analysis Date: 09-JUN-1997 18:44  
File: /chem/IONTRAP2.i/vc060997.b/9733048a.d  
Project Info: LRY/BN  
Sample Info: 140101-1551

Lab No.: 97-33048  
Report Date: 06/17/97 11:25  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

**L-87-3****EPA METHOD 624****VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	12	
trans-1,2-Dichloroethene	156-60-5	<0.50	0.42J
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	44	D
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	7.5	
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.33	93	80--120
Toluene d8	10.0	9.86	99	80--120
p-Bromofluorobenzene	10.0	10.8	108	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

D= Value was derived from a 10 times dilution.

J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: HJCReviewing Supervisor: William D. Brown

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FAX (406) 252-6069 • 1-800-735-4489

Client: Envirocon, Inc.  
Date Sampled: 29-MAY-97  
Date Received: 31-MAY-97  
Analysis Date: 09-JUN-1997 21:48  
File: /chem/IONTRAP2.1/vc060997.b/9733049a.d  
Project Info: LRY/BN  
Sample Info: 140101-1552

Lab No.: 97-33049  
Report Date: 06/17/97 11:25  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

#3  
**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.0	100	80--120
Toluene d8	10.0	8.86	89	80--120
p-Bromofluorobenzene	10.0	10.2	102	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: MJB

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Client: Envirocon, Inc.  
Date Sampled: 29-MAY-97  
Date Received: 31-MAY-97  
Analysis Date: 09-JUN-1997 20:16  
File: /chem/IONTRAP2.1/vc060997.b/9733050a.d  
Project Info: LRY/BN  
Sample Info: 140101-1554

Lab No.: 97-33050  
Report Date: 06/17/97 11:25  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

*Trip blank*  
EPA METHOD 624

**VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
<b>Chloroform</b>	<b>67-66-3</b>	<b>0.52</b>	
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.68	97	80--120
Toluene d8	10.0	10.0	100	80--120
p-Bromofluorobenzene	10.0	10.2	102	80--120

## QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJCReviewing Supervisor: NAB



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Client: Envirocon, Inc.  
Date Sampled: 30-MAY-97  
Date Received: 31-MAY-97  
Analysis Date: 10-JUN-1997 11:08  
File: /chem/IONTRAP2.i/vc061097.b/9733051a.d  
Project Info: LRY/BN  
Sample Info: 140101-1561

Lab No.: 97-33051  
Report Date: 06/11/97 12:58  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

89-4  
**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	2.5	
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	87	D
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	1.1	
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.28	83	80--120
Toluene d8	10.0	10.3	103	80--120
p-Bromofluorobenzene	10.0	11.9	119	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

D= Value was derived from a 20 times dilution.

REPORT COMMENTS: None

Analyst: 7AX Reviewing Supervisor: MTB

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Client: Envirocon, Inc.  
Date Sampled: 30-MAY-97  
Date Received: 31-MAY-97  
Analysis Date: 09-JUN-1997 23:22  
File: /chem/IONTRAP2.i/vc060997.b/9733052a.d  
Project Info: LRY/BN  
Sample Info: 140101-1562

Lab No.: 97-33052  
Report Date: 06/17/97 11:26  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	3.3	
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	69	D
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	5.0	
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.47	95	80--120
Toluene d8	10.0	10.3	103	80--120
p-Bromofluorobenzene	10.0	10.3	103	80--120

## QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

D= Value was derived from a 10 times dilution.

REPORT COMMENTS: None

Analyst: FJCReviewing Supervisor: MTB

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Client: Envirocon, Inc.  
Date Sampled: 30-MAY-97  
Date Received: 31-MAY-97  
Analysis Date: 10-JUN-1997 17:10  
File: /chem/IONTRAP2.1/vc061097.b/9733053a.d  
Project Info: LRY/BN  
Sample Info: 140101-1563

Lab No.: 97-33053  
Report Date: 06/17/97 11:45  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

92-1  
**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
<b>cis-1,2-Dichloroethene</b>	<b>156-59-2</b>	<b>8.6</b>	
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
<b>Tetrachloroethene</b>	<b>127-18-4</b>	<b>85</b>	<b>D</b>
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
<b>Trichloroethene</b>	<b>79-01-6</b>	<b>&lt;0.50</b>	<b>0.37J</b>
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

----- **SURROGATE RECOVERY REPORT** -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.93	99	80--120
Toluene d8	10.0	9.47	95	80--120
p-Bromofluorobenzene	10.0	10.5	105	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

- U= Indicates compound was analyzed for but not detected.
- D= Value was derived from a 20 times dilution.
- J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: TAO      Reviewing Supervisor: NTB



Quality Control Sample: Laboratory Reagent Blank 09-JUN-97 15:14

Report Date: 06/09/97 15:47

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /chem/IONTRAP2.i/vc060997.b/blk0609b.d

Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.80	88	80--120
Toluene d8	10.0	10.0	100	80--120
p-Bromofluorobenzene	10.0	11.0	110	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: MMJ



Quality Control Sample: Laboratory Reagent Blank 10-JUN-1997 09:31  
Report Date: 06/17/97 11:41  
Extraction Method: EPA 5030  
Sample Matrix: WATER  
File: /chem/IONTRAP2.i/vc061097.b/blk0610b.d  
Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT  
=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.3	103	80--120
Toluene d8	10.0	10.1	101	80--120
p-Bromofluorobenzene	10.0	11.3	113	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:  
U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJC      Reviewing Supervisor: [Signature]

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Client: Envirocon, Inc.  
Date Sampled: 29-MAY-97  
Date Received: 31-MAY-97  
Analysis Date: 10-JUN-1997 15:32  
File: /chem/IONTRAP2.1/vc061097.b/9733054a.d  
Project Info: LRY/BN  
Sample Info: 140101-1553

Lab No.: 97-33054  
Report Date: 06/17/97 11:45  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

**L-88-10****EPA METHOD 524.2****VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)				
COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
-----REGULATED VOLATILE ORGANIC CHEMICALS (VOC'S)-----				
Benzene	71-43-2	5	<0.50	U
Carbon Tetrachloride	56-23-5	5	<0.50	U
Chlorobenzene	108-90-7	100	3.0	
1,2-Dichlorobenzene	95-50-1	600	<0.50	U
1,4-Dichlorobenzene	106-46-7	75	0.53	
1,2-Dichloroethane	107-06-2	5	<0.50	U
1,1-Dichloroethene	75-35-4	7	<0.50	U
cis-1,2-Dichloroethene	156-59-2	70	12	
trans-1,2-Dichloroethene	156-60-5	100	<0.50	U
1,2-Dichloropropane	78-87-5	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Methylene Chloride	75-09-2	5	<0.50	U
Styrene	100-42-5	100	<0.50	U
Tetrachloroethene	127-18-4	5	19	D
Toluene	108-88-3	1000	<0.50	U
1,2,4-Trichlorobenzene	120-82-1	70	<0.50	U
1,1,1-Trichloroethane	71-55-6	200	<0.50	U
1,1,2-Trichloroethane	79-00-5	5	<0.50	U
Trichloroethene	79-01-6	5	8.7	
Vinyl Chloride	75-01-4	2	<0.50	0.34J
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U
-----REGULATED VOC'S: TRIHALOMETHANES-----				
Bromodichloromethane	75-27-4	Total	<0.50	U
Bromoform	75-25-2	of all	<0.50	U
Chlorodibromomethane	124-48-1	four	<0.50	U
Chloroform	67-66-3	100	<0.50	U
-----OTHER EPA LISTED VOC'S-----				
Bromobenzene	108-86-1	NR	<0.50	U
Bromochloromethane	74-97-5	NR	<0.50	U
Bromomethane	74-83-9	NR	<0.50	U
n-Butylbenzene	104-51-8	NR	<0.50	U
sec-Butylbenzene	135-98-8	NR	<0.50	U
tert-Butylbenzene	98-06-6	NR	<0.50	U
Chloroethane	75-00-3	NR	<0.50	U
Chloromethane	74-87-3	NR	<0.50	U
2-Chlorotoluene	95-49-8	NR	<0.50	0.42J
4-Chlorotoluene	106-43-4	NR	<0.50	U
1,2-Dibromo-3-chloropropane	96-12-8	NA	<0.50	U

(report continued on page 2)

EPA METHOD 524.2  
VOLATILE ORGANICS ANALYSIS REPORT (continued)  
=====

CONCENTRATION UNITS = ug/L (ppb)				
COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
1,2-Dibromoethane	106-93-4	NA	<0.50	U
Dibromomethane	74-95-3	NR	<0.50	U
1,3-Dichlorobenzene	541-73-1	NR	<0.50	U
Dichlorodifluoromethane	75-71-8	NR	<0.50	U
1,1-Dichloroethane	75-34-3	NR	<0.50	U
1,1-Dichloropropene	563-58-6	NR	<0.50	U
1,3-Dichloropropane	142-28-9	NR	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	NR	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	NR	<0.50	U
2,2-Dichloropropane	594-20-7	NR	<0.50	U
Fluorotrichloromethane	75-69-4	NR	<0.50	U
Hexachlorobutadiene	87-68-3	NR	<0.50	U
Isopropylbenzene	98-82-8	NR	<0.50	U
p-Isopropyltoluene	99-87-6	NR	<0.50	U
Naphthalene	91-20-3	NR	<0.50	U
n-Propylbenzene	103-65-1	NR	<0.50	U
1,1,1,2-Tetrachloroethane	630-20-6	NR	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	NR	<0.50	U
1,2,3-Trichlorobenzene	87-61-6	NR	<0.50	U
1,2,3-Trichloropropane	96-18-4	NR	<0.50	U
1,2,4-Trimethylbenzene	95-63-6	NR	<0.50	U
1,3,5-Trimethylbenzene	108-67-8	NR	<0.50	U

SURROGATE RECOVERY REPORT				
Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.08	81	80--120
Toluene d8	10.0	10.1	101	80--120
p-Bromofluorobenzene	10.0	11.5	115	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

- U= Indicates compound was analyzed for but not detected.
- D= Value derived from a 10 times dilution.
- J= Estimated value. Present, but less than the limit of quantitation.
- NR= No currently regulated amount.
- NA= Not applicable to this method. Concentrations are presented for screening purposes. For regulatory compliance, analyze using EPA method 504 which has lower detection limits.

REPORT COMMENTS: None

Analyst: HYC      Reviewing Supervisor: MTB

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Client: Envirocon, Inc.  
Date Sampled: 29-MAY-97  
Date Received: 31-MAY-97  
Analysis Date: 10-JUN-1997 14:01  
File: /chem/IONTRAP2.i/vc061097.b/9733055a.d  
Project Info: LRY/BN  
Sample Info: 140101-1555

Lab No.: 97-33055  
Report Date: 06/17/97 11:45  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

**L-88-13****EPA METHOD 524.2  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)				
COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
-----REGULATED VOLATILE ORGANIC CHEMICALS (VOC'S)-----				
Benzene	71-43-2	5	<0.50	U
Carbon Tetrachloride	56-23-5	5	<0.50	U
Chlorobenzene	108-90-7	100	<0.50	U
1,2-Dichlorobenzene	95-50-1	600	<0.50	U
1,4-Dichlorobenzene	106-46-7	75	<0.50	U
1,2-Dichloroethane	107-06-2	5	<0.50	U
1,1-Dichloroethene	75-35-4	7	<0.50	U
cis-1,2-Dichloroethene	156-59-2	70	1.0	
trans-1,2-Dichloroethene	156-60-5	100	<0.50	U
1,2-Dichloropropane	78-87-5	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Methylene Chloride	75-09-2	5	<0.50	U
Styrene	100-42-5	100	<0.50	U
Tetrachloroethene	127-18-4	5	15	
Toluene	108-88-3	1000	<0.50	U
1,2,4-Trichlorobenzene	120-82-1	70	<0.50	U
1,1,1-Trichloroethane	71-55-6	200	<0.50	U
1,1,2-Trichloroethane	79-00-5	5	<0.50	U
Trichloroethene	79-01-6	5	2.4	
Vinyl Chloride	75-01-4	2	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U
-----REGULATED VOC'S: TRIHALOMETHANES-----				
Bromodichloromethane	75-27-4	Total	<0.50	U
Bromoform	75-25-2	of all	<0.50	U
Chlorodibromomethane	124-48-1	four	<0.50	U
Chloroform	67-66-3	100	<0.50	U
-----OTHER EPA LISTED VOC'S-----				
Bromobenzene	108-86-1	NR	<0.50	U
Bromochloromethane	74-97-5	NR	<0.50	U
Bromomethane	74-83-9	NR	<0.50	U
n-Butylbenzene	104-51-8	NR	<0.50	U
sec-Butylbenzene	135-98-8	NR	<0.50	U
tert-Butylbenzene	98-06-6	NR	<0.50	U
Chloroethane	75-00-3	NR	<0.50	U
Chloromethane	74-87-3	NR	<0.50	U
2-Chlorotoluene	95-49-8	NR	<0.50	U
4-Chlorotoluene	106-43-4	NR	<0.50	U
1,2-Dibromo-3-chloropropane	96-12-8	NA	<0.50	U

(report continued on page 2)



EPA METHOD 524.2  
VOLATILE ORGANICS ANALYSIS REPORT (continued)  
=====

CONCENTRATION UNITS = ug/L (ppb)				
COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
1,2-Dibromoethane	106-93-4	NA	<0.50	U
Dibromomethane	74-95-3	NR	<0.50	U
1,3-Dichlorobenzene	541-73-1	NR	<0.50	U
Dichlorodifluoromethane	75-71-8	NR	<0.50	U
1,1-Dichloroethane	75-34-3	NR	<0.50	U
1,1-Dichloropropene	563-58-6	NR	<0.50	U
1,3-Dichloropropane	142-28-9	NR	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	NR	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	NR	<0.50	U
2,2-Dichloropropane	594-20-7	NR	<0.50	U
Fluorotrichloromethane	75-69-4	NR	<0.50	U
Hexachlorobutadiene	87-68-3	NR	<0.50	U
Isopropylbenzene	98-82-8	NR	<0.50	U
p-Isopropyltoluene	99-87-6	NR	<0.50	U
Naphthalene	91-20-3	NR	<0.50	U
n-Propylbenzene	103-65-1	NR	<0.50	U
1,1,1,2-Tetrachloroethane	630-20-6	NR	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	NR	<0.50	U
1,2,3-Trichlorobenzene	87-61-6	NR	<0.50	U
1,2,3-Trichloropropane	96-18-4	NR	<0.50	U
1,2,4-Trimethylbenzene	95-63-6	NR	<0.50	U
1,3,5-Trimethylbenzene	108-67-8	NR	<0.50	U

SURROGATE RECOVERY REPORT -----				
Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.75	98	80--120
Toluene d8	10.0	10.1	101	80--120
p-Bromofluorobenzene	10.0	9.55	96	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

- U= Indicates compound was analyzed for but not detected.
- NR= No currently regulated amount.
- NA= Not applicable to this method. Concentrations are presented for screening purposes. For regulatory compliance, analyze using EPA method 504 which has lower detection limits.

REPORT COMMENTS: None

Analyst: SAJC      Reviewing Supervisor: NRB

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Client: Envirocon, Inc.  
Date Sampled: 29-MAY-97  
Date Received: 31-MAY-97  
Analysis Date: 10-JUN-1997 18:46  
File: /chem/IONTRAP2.i/vc061097.b/9733056a.d  
Project Info: LRY/BN  
Sample Info: 140101-1556

Lab No.: 97-33056  
Report Date: 06/17/97 11:46  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

**L-87-8****EPA METHOD 524.2****VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)				
COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
-----REGULATED VOLATILE ORGANIC CHEMICALS (VOC'S)-----				
Benzene	71-43-2	5	<0.50	U
Carbon Tetrachloride	56-23-5	5	<0.50	U
Chlorobenzene	108-90-7	100	<0.50	U
1,2-Dichlorobenzene	95-50-1	600	<0.50	U
1,4-Dichlorobenzene	106-46-7	75	<0.50	U
1,2-Dichloroethane	107-06-2	5	<0.50	U
1,1-Dichloroethene	75-35-4	7	<0.50	U
cis-1,2-Dichloroethene	156-59-2	70	<0.50	0.43J
trans-1,2-Dichloroethene	156-60-5	100	<0.50	U
1,2-Dichloropropane	78-87-5	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Methylene Chloride	75-09-2	5	<0.50	U
Styrene	100-42-5	100	<0.50	U
Tetrachloroethene	127-18-4	5	2.5	
Toluene	108-88-3	1000	<0.50	U
1,2,4-Trichlorobenzene	120-82-1	70	<0.50	U
1,1,1-Trichloroethane	71-55-6	200	<0.50	U
1,1,2-Trichloroethane	79-00-5	5	<0.50	U
Trichloroethene	79-01-6	5	0.74	
Vinyl Chloride	75-01-4	2	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U
-----REGULATED VOC'S: TRIHALOMETHANES-----				
Bromodichloromethane	75-27-4	Total	<0.50	U
Bromoform	75-25-2	of all	<0.50	U
Chlorodibromomethane	124-48-1	four	<0.50	U
Chloroform	67-66-3	100	<0.50	U
-----OTHER EPA LISTED VOC'S-----				
Bromobenzene	108-86-1	NR	<0.50	U
Bromochloromethane	74-97-5	NR	<0.50	U
Bromomethane	74-83-9	NR	<0.50	U
n-Butylbenzene	104-51-8	NR	<0.50	U
sec-Butylbenzene	135-98-8	NR	<0.50	U
tert-Butylbenzene	98-06-6	NR	<0.50	U
Chloroethane	75-00-3	NR	<0.50	U
Chloromethane	74-87-3	NR	<0.50	U
2-Chlorotoluene	95-49-8	NR	<0.50	U
4-Chlorotoluene	106-43-4	NR	<0.50	U
1,2-Dibromo-3-chloropropane	96-12-8	NA	<0.50	U

(report continued on page 2)

EPA METHOD 524.2  
VOLATILE ORGANICS ANALYSIS REPORT (continued)  
=====

CONCENTRATION UNITS = ug/L (ppb)				
COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
1,2-Dibromoethane	106-93-4	NA	<0.50	U
Dibromomethane	74-95-3	NR	<0.50	U
1,3-Dichlorobenzene	541-73-1	NR	<0.50	U
Dichlorodifluoromethane	75-71-8	NR	<0.50	U
1,1-Dichloroethane	75-34-3	NR	<0.50	U
1,1-Dichloropropene	563-58-6	NR	<0.50	U
1,3-Dichloropropane	142-28-9	NR	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	NR	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	NR	<0.50	U
2,2-Dichloropropane	594-20-7	NR	<0.50	U
Fluorotrichloromethane	75-69-4	NR	<0.50	U
Hexachlorobutadiene	87-68-3	NR	<0.50	U
Isopropylbenzene	98-82-8	NR	<0.50	U
p-Isopropyltoluene	99-87-6	NR	0.76	
Naphthalene	91-20-3	NR	<0.50	U
n-Propylbenzene	103-65-1	NR	<0.50	U
1,1,1,2-Tetrachloroethane	630-20-6	NR	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	NR	<0.50	U
1,2,3-Trichlorobenzene	87-61-6	NR	<0.50	U
1,2,3-Trichloropropane	96-18-4	NR	<0.50	U
1,2,4-Trimethylbenzene	95-63-6	NR	<0.50	0.44J
1,3,5-Trimethylbenzene	108-67-8	NR	<0.50	0.38J

SURROGATE RECOVERY REPORT -----				
Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.2	102	80--120
Toluene d8	10.0	9.79	98	80--120
p-Bromofluorobenzene	10.0	10.1	101	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

- U= Indicates compound was analyzed for but not detected.
- J= Estimated value. Present, but less than the limit of quantitation.
- NR= No currently regulated amount.
- NA= Not applicable to this method. Concentrations are presented for screening purposes. For regulatory compliance, analyze using EPA method 504 which has lower detection limits.

REPORT COMMENTS: None

Analyst: HJ      Reviewing Supervisor: MAN



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FAX (406) 252-6069 • 1-800-735-4489

Client: Envirocon, Inc.  
Date Sampled: 29-MAY-97  
Date Received: 31-MAY-97  
Analysis Date: 11-JUN-1997 16:41  
File: /chem/5971A.i/va061197.b/jun111001010.d  
Project Info: LRY/BN  
Sample Info: 140101-1557

Lab No.: 97-33057  
Report Date: 06/12/97 16:29  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

**L-87-7****EPA METHOD 524.2****VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L				
COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
-----REGULATED VOLATILE ORGANIC CHEMICALS (VOC'S)-----				
Benzene	71-43-2	5	<0.50	0.45J
Carbon tetrachloride	56-23-5	5	<0.50	U
Chlorobenzene	108-90-7	100	<0.50	U
1,2-Dichlorobenzene	95-50-1	600	<0.50	U
1,4-Dichlorobenzene	106-46-7	75	<0.50	U
1,2-Dichloroethane	107-06-2	5	<0.50	U
1,1-Dichloroethene	75-35-4	7	<0.50	U
cis-1,2-Dichloroethene	156-59-2	70	<0.50	U
trans-1,2-Dichloroethene	156-60-5	100	<0.50	U
1,2-Dichloropropane	78-87-5	5	<0.50	U
Ethyl benzene	100-41-4	700	4.2	
Methylene chloride	75-09-2	5	<0.50	U
Styrene	100-42-5	100	<0.50	U
Tetrachloroethene	127-18-4	5	<0.50	U
Toluene	108-88-3	1000	<0.50	U
1,2,4-Trichlorobenzene	120-82-1	70	<0.50	U
1,1,1-Trichloroethane	71-55-6	200	<0.50	U
1,1,2-Trichloroethane	79-00-5	5	<0.50	U
Trichloroethene	79-01-6	5	<0.50	U
Vinyl chloride	75-01-4	2	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		2.3	
Total Xylenes		10000	2.3	
-----REGULATED VOC'S: TRIHALOMETHANES-----				
Bromodichloromethane	75-27-4	Total	<0.50	U
Bromoform	75-25-2	of all	<0.50	U
Chlorodibromomethane	124-48-1	four	<0.50	U
Chloroform	67-66-3	100	<0.50	U
-----OTHER EPA LISTED VOC'S-----				
Bromobenzene	108-86-1	NR	<0.50	U
Bromochloromethane	74-97-5	NR	<0.50	U
Bromomethane	74-83-9	NR	<0.50	U
n-Butylbenzene	104-51-8	NR	<0.50	U
sec-Butylbenzene	135-98-8	NR	4.3	
tert-Butylbenzene	98-06-6	NR	<0.50	U
Chloroethane	75-00-3	NR	<0.50	U
Chloromethane	74-87-3	NR	<0.50	U
2-Chlorotoluene	95-49-8	NR	1.2	
4-Chlorotoluene	106-43-4	NR	<0.50	U
1,2-Dibromo-3-chloropropane	96-12-8	NA	<1.0	U

(report continued on page 2)

EPA METHOD 524.2  
VOLATILE ORGANICS ANALYSIS REPORT (continued)

CONCENTRATION UNITS = ug/L				
COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
1,2-Dibromoethane	106-93-4	NA	<0.50	U
Dibromomethane	74-95-3	NR	<0.50	U
1,3-Dichlorobenzene	541-73-1	NR	<0.50	U
Dichlorodifluoromethane	75-71-8	NR	<0.50	U
1,1-Dichloroethane	75-34-3	NR	<0.50	U
1,1-Dichloropropene	563-58-6	NR	<0.50	U
1,3-Dichloropropane	142-28-9	NR	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	NR	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	NR	<0.50	U
2,2-Dichloropropane	594-20-7	NR	<0.50	U
Fluorotrichloromethane	75-69-4	NR	<0.50	U
Hexachlorobutadiene	87-68-3	NR	<0.50	U
Isopropylbenzene	98-82-8	NR	5.6	
p-Isopropyltoluene	99-87-6	NR	<0.50	U
Naphthalene	91-20-3	NR	21	D
n-Propylbenzene	103-65-1	NR	3.4	
1,1,1,2-Tetrachloroethane	630-20-6	NR	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	NR	<0.50	U
1,2,3-Trichlorobenzene	87-61-6	NR	<0.50	U
1,2,3-Trichloropropane	96-18-4	NR	<0.50	U
1,2,4-Trimethylbenzene	95-63-6	NR	<0.50	U
1,3,5-Trimethylbenzene	108-67-8	NR	<0.50	U

SURROGATE RECOVERY REPORT				
Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	9.59	96	80--120
Toluene d8	10.0	9.82	98	80--120
p-Bromofluorobenzene	10.0	9.82	98	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

D= Value derived from a 10 times dilution.

J= Estimated value. Present, but less than the limit of quantitation.

NR= No currently regulated amount.

NA= Not applicable to this method. Concentrations are presented for screening purposes. For regulatory compliance, analyze using EPA method 504 which has lower detection limits.

REPORT COMMENTS: None

Analyst: CB      Reviewing Supervisor: MB

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FAX (406) 252-6069 • 1-800-735-4489

Client: Envirocon, Inc.

Date Sampled: 29-MAY-97

Date Received: 31-MAY-97

Analysis Date: 11-JUN-1997 18:02

File: /chem/5971A.1/va061197.b/jun111201012.d

Project Info: LRY/BN

Sample Info: 140101-1558

Lab No.: 97-33058

Report Date: 06/12/97 16:29

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

*L-87-7 Duplicate*  
EPA METHOD 524.2**VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L				
COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
-----REGULATED VOLATILE ORGANIC CHEMICALS (VOC'S)-----				
Benzene	71-43-2	5	0.51	
Carbon tetrachloride	56-23-5	5	<0.50	U
Chlorobenzene	108-90-7	100	<0.50	U
1,2-Dichlorobenzene	95-50-1	600	<0.50	U
1,4-Dichlorobenzene	106-46-7	75	<0.50	U
1,2-Dichloroethane	107-06-2	5	<0.50	U
1,1-Dichloroethene	75-35-4	7	<0.50	U
cis-1,2-Dichloroethene	156-59-2	70	<0.50	U
trans-1,2-Dichloroethene	156-60-5	100	<0.50	U
1,2-Dichloropropane	78-87-5	5	<0.50	U
Ethyl benzene	100-41-4	700	4.6	
Methylene chloride	75-09-2	5	<0.50	U
Styrene	100-42-5	100	<0.50	U
Tetrachloroethene	127-18-4	5	<0.50	U
Toluene	108-88-3	1000	<0.50	U
1,2,4-Trichlorobenzene	120-82-1	70	<0.50	U
1,1,1-Trichloroethane	71-55-6	200	<0.50	U
1,1,2-Trichloroethane	79-00-5	5	<0.50	U
Trichloroethene	79-01-6	5	<0.50	U
Vinyl chloride	75-01-4	2	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		2.5	
Total Xylenes		10000	2.5	
-----REGULATED VOC'S: TRIHALOMETHANES-----				
Bromodichloromethane	75-27-4	Total	<0.50	U
Bromoform	75-25-2	of all	<0.50	U
Chlorodibromomethane	124-48-1	four	<0.50	U
Chloroform	67-66-3	100	<0.50	U
-----OTHER EPA LISTED VOC'S-----				
Bromobenzene	108-86-1	NR	<0.50	U
Bromochloromethane	74-97-5	NR	<0.50	U
Bromomethane	74-83-9	NR	<0.50	U
n-Butylbenzene	104-51-8	NR	<0.50	U
sec-Butylbenzene	135-98-8	NR	4.4	
tert-Butylbenzene	98-06-6	NR	<0.50	U
Chloroethane	75-00-3	NR	<0.50	U
Chloromethane	74-87-3	NR	<0.50	U
2-Chlorotoluene	95-49-8	NR	1.3	
4-Chlorotoluene	106-43-4	NR	<0.50	U
1,2-Dibromo-3-chloropropane	96-12-8	NA	<1.0	U

(report continued on page 2)

EPA METHOD 524.2  
VOLATILE ORGANICS ANALYSIS REPORT (continued)  
=====

CONCENTRATION UNITS = ug/L				
COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
1,2-Dibromoethane	106-93-4	NA	<0.50	U
Dibromomethane	74-95-3	NR	<0.50	U
1,3-Dichlorobenzene	541-73-1	NR	<0.50	U
Dichlorodifluoromethane	75-71-8	NR	<0.50	U
1,1-Dichloroethane	75-34-3	NR	<0.50	U
1,1-Dichloropropene	563-58-6	NR	<0.50	U
1,3-Dichloropropane	142-28-9	NR	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	NR	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	NR	<0.50	U
2,2-Dichloropropane	594-20-7	NR	<0.50	U
Fluorotrichloromethane	75-69-4	NR	<0.50	U
Hexachlorobutadiene	87-68-3	NR	<0.50	U
Isopropylbenzene	98-82-8	NR	5.8	
p-Isopropyltoluene	99-87-6	NR	<0.50	U
Naphthalene	91-20-3	NR	23	D
n-Propylbenzene	103-65-1	NR	3.8	
1,1,1,2-Tetrachloroethane	630-20-6	NR	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	NR	<0.50	U
1,2,3-Trichlorobenzene	87-61-6	NR	<0.50	U
1,2,3-Trichloropropane	96-18-4	NR	<0.50	U
1,2,4-Trimethylbenzene	95-63-6	NR	<0.50	U
1,3,5-Trimethylbenzene	108-67-8	NR	<0.50	U

SURROGATE RECOVERY REPORT				
Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.72	97	80--120
Toluene d8	10.0	9.85	98	80--120
p-Bromofluorobenzene	10.0	10.6	106	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

D= Value derived from a 10 times dilution.

NR= No currently regulated amount.

NA= Not applicable to this method. Concentrations are presented for screening purposes. For regulatory compliance, analyze using EPA method 504 which has lower detection limits.

REPORT COMMENTS: None

Analyst: Co      Reviewing Supervisor: MB



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Client: Envirocon, Inc.  
Date Sampled: 29-MAY-97  
Date Received: 31-MAY-97  
Analysis Date: 11-JUN-1997 19:17  
File: /chem/5971A.i/va061197.b/jun111401014.d  
Project Info: LRY/BN  
Sample Info: 140101-1559

Lab No.: 97-33059  
Report Date: 06/12/97 16:29  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

**L-87-4****EPA METHOD 524.2****VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
-----REGULATED VOLATILE ORGANIC CHEMICALS (VOC'S)-----				
Benzene	71-43-2	5	<0.50	U
Carbon tetrachloride	56-23-5	5	<0.50	U
Chlorobenzene	108-90-7	100	<0.50	U
1,2-Dichlorobenzene	95-50-1	600	<0.50	U
1,4-Dichlorobenzene	106-46-7	75	<0.50	U
1,2-Dichloroethane	107-06-2	5	<0.50	U
1,1-Dichloroethene	75-35-4	7	<0.50	U
cis-1,2-Dichloroethene	156-59-2	70	<0.50	U
trans-1,2-Dichloroethene	156-60-5	100	<0.50	U
1,2-Dichloropropane	78-87-5	5	<0.50	U
Ethyl benzene	100-41-4	700	<0.50	U
Methylene chloride	75-09-2	5	<0.50	U
Styrene	100-42-5	100	<0.50	U
Tetrachloroethene	127-18-4	5	<0.50	U
Toluene	108-88-3	1000	<0.50	U
1,2,4-Trichlorobenzene	120-82-1	70	<0.50	U
1,1,1-Trichloroethane	71-55-6	200	<0.50	U
1,1,2-Trichloroethane	79-00-5	5	<0.50	U
Trichloroethene	79-01-6	5	<0.50	U
Vinyl chloride	75-01-4	2	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U
-----REGULATED VOC'S: TRIHALOMETHANES-----				
Bromodichloromethane	75-27-4	Total	<0.50	U
Bromoform	75-25-2	of all	<0.50	U
Chlorodibromomethane	124-48-1	four	<0.50	U
Chloroform	67-66-3	100	<0.50	U
-----OTHER EPA LISTED VOC'S-----				
Bromobenzene	108-86-1	NR	<0.50	U
Bromochloromethane	74-97-5	NR	<0.50	U
Bromomethane	74-83-9	NR	<0.50	U
n-Butylbenzene	104-51-8	NR	<0.50	U
sec-Butylbenzene	135-98-8	NR	<0.50	0.19J
tert-Butylbenzene	98-06-6	NR	<0.50	U
Chloroethane	75-00-3	NR	<0.50	U
Chloromethane	74-87-3	NR	<0.50	U
2-Chlorotoluene	95-49-8	NR	<0.50	U
4-Chlorotoluene	106-43-4	NR	<0.50	U
1,2-Dibromo-3-chloropropane	96-12-8	NA	<1.0	U

(report continued on page 2)

EPA METHOD 524.2  
VOLATILE ORGANICS ANALYSIS REPORT (continued)

CONCENTRATION UNITS = ug/L				
COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
1,2-Dibromoethane	106-93-4	NA	<0.50	U
Dibromomethane	74-95-3	NR	<0.50	U
1,3-Dichlorobenzene	541-73-1	NR	<0.50	U
Dichlorodifluoromethane	75-71-8	NR	<0.50	U
1,1-Dichloroethane	75-34-3	NR	<0.50	U
1,1-Dichloropropene	563-58-6	NR	<0.50	U
1,3-Dichloropropene	142-28-9	NR	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	NR	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	NR	<0.50	U
2,2-Dichloropropene	594-20-7	NR	<0.50	U
Fluorotrichloromethane	75-69-4	NR	<0.50	U
Hexachlorobutadiene	87-68-3	NR	<0.50	U
Isopropylbenzene	98-82-8	NR	<0.50	U
p-Isopropyltoluene	99-87-6	NR	<0.50	U
Naphthalene	31-20-3	NR	0.69	
n-Propylbenzene	103-65-1	NR	<0.50	U
1,1,1,2-Tetrachloroethane	630-20-6	NR	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	NR	<0.50	U
1,2,3-Trichlorobenzene	87-61-6	NR	<0.50	U
1,2,3-Trichloropropane	96-18-4	NR	<0.50	U
1,2,4-Trimethylbenzene	95-63-6	NR	<0.50	0.46J
1,3,5-Trimethylbenzene	108-67-8	NR	<0.50	U

SURROGATE RECOVERY REPORT				
Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	9.56	96	80--120
Toluene d8	10.0	9.63	96	80--120
p-Bromofluorobenzene	10.0	10.0	100	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

J= Estimated value. Present, but less than the limit of quantitation.

NR= No currently regulated amount.

NA= Not applicable to this method. Concentrations are presented for screening purposes. For regulatory compliance, analyze using EPA method 504 which has lower detection limits.

REPORT COMMENTS: None

Analyst:   *js*   Reviewing Supervisor:   *MP*



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FAX (406) 252-6069 • 1-800-735-4489

Client: Envirocon, Inc.  
Date Sampled: 29-MAY-97  
Date Received: 31-MAY-97  
Analysis Date: 13-JUN-1997 19:40  
File: /chem/IONTRAP2.i/vc061397.b/9733059b.d  
Project Info: LRY/BN  
Sample Info: 140101-1559

Lab No.: 97-33059 Duplicate  
Report Date: 06/17/97 13:33  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

L-87-4 Lab Duplicate  
EPA METHOD 524.2

**VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
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=====	=====	=====	=====	=====
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## -----REGULATED VOLATILE ORGANIC CHEMICALS (VOC'S)-----

Benzene	71-43-2	5	<0.50	U
Carbon Tetrachloride	56-23-5	5	<0.50	U
Chlorobenzene	108-90-7	100	<0.50	U
1,2-Dichlorobenzene	95-50-1	600	<0.50	U
1,4-Dichlorobenzene	106-46-7	75	<0.50	U
1,2-Dichloroethane	107-06-2	5	<0.50	U
1,1-Dichloroethene	75-35-4	7	<0.50	U
cis-1,2-Dichloroethene	156-59-2	70	<0.50	U
trans-1,2-Dichloroethene	156-60-5	100	<0.50	U
1,2-Dichloropropane	78-87-5	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Methylene Chloride	75-09-2	5	<0.50	U
Styrene	100-42-5	100	<0.50	U
Tetrachloroethene	127-18-4	5	<0.50	U
Toluene	108-88-3	1000	<0.50	U
1,2,4-Trichlorobenzene	120-82-1	70	<0.50	U
1,1,1-Trichloroethane	71-55-6	200	<0.50	U
1,1,2-Trichloroethane	79-00-5	5	<0.50	U
Trichloroethene	79-01-6	5	<0.50	U
Vinyl Chloride	75-01-4	2	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

## -----REGULATED VOC'S: TRIHALOMETHANES-----

Bromodichloromethane	75-27-4	Total	<0.50	U
Bromoform	75-25-2	of all	<0.50	U
Chlorodibromomethane	124-48-1	four	<0.50	U
Chloroform	67-66-3	100	<0.50	U

## -----OTHER EPA LISTED VOC'S-----

Bromobenzene	108-86-1	NR	<0.50	U
Bromochloromethane	74-97-5	NR	<0.50	U
Bromomethane	74-83-9	NR	<0.50	U
n-Butylbenzene	104-51-8	NR	<0.50	U
sec-Butylbenzene	135-98-8	NR	<0.50	0.27J
tert-Butylbenzene	98-06-6	NR	<0.50	U
Chloroethane	75-00-3	NR	<0.50	U
Chloromethane	74-87-3	NR	<0.50	U
2-Chlorotoluene	95-49-8	NR	<0.50	U
4-Chlorotoluene	106-43-4	NR	<0.50	U
1,2-Dibromo-3-chloropropane	96-12-8	NA	<0.50	U

(report continued on page 2)

EPA METHOD 524.2  
VOLATILE ORGANICS ANALYSIS REPORT (continued)  
=====

CONCENTRATION UNITS = ug/L (ppb)				
COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
1,2-Dibromoethane	106-93-4	NA	<0.50	U
Dibromomethane	74-95-3	NR	<0.50	U
1,3-Dichlorobenzene	541-73-1	NR	<0.50	U
Dichlorodifluoromethane	75-71-8	NR	<0.50	U
1,1-Dichloroethane	75-34-3	NR	<0.50	U
1,1-Dichloropropene	563-58-6	NR	<0.50	U
1,3-Dichloropropane	142-28-9	NR	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	NR	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	NR	<0.50	U
2,2-Dichloropropane	594-20-7	NR	<0.50	U
Fluorotrichloromethane	75-69-4	NR	<0.50	U
Hexachlorobutadiene	87-68-3	NR	<0.50	U
Isopropylbenzene	98-82-8	NR	<0.50	U
p-Isopropyltoluene	99-87-6	NR	<0.50	U
Naphthalene	91-20-3	NR	0.54	
n-Propylbenzene	103-65-1	NR	<0.50	U
1,1,1,2-Tetrachloroethane	630-20-6	NR	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	NR	<0.50	U
1,2,3-Trichlorobenzene	87-61-6	NR	<0.50	U
1,2,3-Trichloropropane	96-18-4	NR	<0.50	U
1,2,4-Trimethylbenzene	95-63-6	NR	0.55	
1,3,5-Trimethylbenzene	108-67-8	NR	<0.50	U

SURROGATE RECOVERY REPORT				
Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.3	103	80--120
Toluene d8	10.0	9.06	91	80--120
p-Bromofluorobenzene	10.0	10.7	107	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

J= Estimated value. Present, but less than the limit of quantitation.

NR= No currently regulated amount.

NA= Not applicable to this method. Concentrations are presented for screening purposes. For regulatory compliance, analyze using EPA method 504 which has lower detection limits.

REPORT COMMENTS: None

Analyst: FAc      Reviewing Supervisor: JMN

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FAX (406) 252-6069 • 1-800-735-4489

Client: Envirocon, Inc.  
Date Sampled: 30-MAY-97  
Date Received: 31-MAY-97  
Analysis Date: 11-JUN-1997 20:33  
File: /chem/5971A.i/va061197.b/jun111601016.d  
Project Info: LRY/BN  
Sample Info: 140101-1560

Lab No.: 97-33060  
Report Date: 06/12/97 16:29  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

**L-87-2****EPA METHOD 524.2****VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====

## -----REGULATED VOLATILE ORGANIC CHEMICALS (VOC'S)-----

Benzene	71-43-2	5	<0.50	U
Carbon tetrachloride	56-23-5	5	<0.50	U
Chlorobenzene	108-90-7	100	28	D
1,2-Dichlorobenzene	95-50-1	600	2.1	
1,4-Dichlorobenzene	106-46-7	75	3.2	
1,2-Dichloroethane	107-06-2	5	<0.50	U
1,1-Dichloroethene	75-35-4	7	<0.50	U
cis-1,2-Dichloroethene	156-59-2	70	21	D
trans-1,2-Dichloroethene	156-60-5	100	1.3	
1,2-Dichloropropane	78-87-5	5	<0.50	U
Ethyl benzene	100-41-4	700	<0.50	0.48J
Methylene chloride	75-09-2	5	<0.50	U
Styrene	100-42-5	100	<0.50	U
Tetrachloroethene	127-18-4	5	<0.50	U
Toluene	108-88-3	1000	0.54	
1,2,4-Trichlorobenzene	120-82-1	70	<0.50	U
1,1,1-Trichloroethane	71-55-6	200	<0.50	U
1,1,2-Trichloroethane	79-00-5	5	<0.50	U
Trichloroethene	79-01-6	5	3.2	
Vinyl chloride	75-01-4	2	20	
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		2.2	
Total Xylenes		10000	2.2	

## -----REGULATED VOC'S: TRIHALOMETHANES-----

Bromodichloromethane	75-27-4	Total	<0.50	U
Bromoform	75-25-2	of all	<0.50	U
Chlorodibromomethane	124-48-1	four	<0.50	U
Chloroform	67-66-3	100	<0.50	U

## -----OTHER EPA LISTED VOC'S-----

Bromobenzene	108-86-1	NR	<0.50	U
Bromochloromethane	74-97-5	NR	<0.50	U
Bromomethane	74-83-9	NR	<0.50	U
n-Butylbenzene	104-51-8	NR	<0.50	U
sec-Butylbenzene	135-98-8	NR	1.2	
tert-Butylbenzene	98-06-6	NR	<0.50	U
Chloroethane	75-00-3	NR	<0.50	U
Chloromethane	74-87-3	NR	<0.50	U
2-Chlorotoluene	95-49-8	NR	49	D
4-Chlorotoluene	106-43-4	NR	<0.50	U
1,2-Dibromo-3-chloropropane	96-12-8	NA	<1.0	U

(report continued on page 2)

EPA METHOD 524.2  
VOLATILE ORGANICS ANALYSIS REPORT (continued)  
=====

CONCENTRATION UNITS = ug/L				
COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
1,2-Dibromoethane	106-93-4	NA	<0.50	U
Dibromomethane	74-95-3	NR	<0.50	U
1,3-Dichlorobenzene	541-73-1	NR	0.52	
Dichlorodifluoromethane	75-71-8	NR	<0.50	U
1,1-Dichloroethane	75-34-3	NR	<0.50	U
1,1-Dichloropropene	563-58-6	NR	<0.50	U
1,3-Dichloropropane	142-28-9	NR	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	NR	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	NR	<0.50	U
2,2-Dichloropropane	594-20-7	NR	<0.50	U
Fluorotrichloromethane	75-69-4	NR	<0.50	U
Hexachlorobutadiene	87-68-3	NR	<0.50	U
Isopropylbenzene	98-82-8	NR	0.66	
p-Isopropyltoluene	99-87-6	NR	<0.50	U
Naphthalene	91-20-3	NR	<0.50	U
n-Propylbenzene	103-65-1	NR	<0.50	U
1,1,1,2-Tetrachloroethane	630-20-6	NR	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	NR	<0.50	U
1,2,3-Trichlorobenzene	87-61-6	NR	<0.50	U
1,2,3-Trichloropropane	96-18-4	NR	<0.50	U
1,2,4-Trimethylbenzene	95-63-6	NR	<0.50	U
1,3,5-Trimethylbenzene	108-67-8	NR	<0.50	U

SURROGATE RECOVERY REPORT				
Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.66	97	80--120
Toluene d8	10.0	9.66	97	80--120
p-Bromofluorobenzene	10.0	10.2	102	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

- U= Indicates compound was analyzed for but not detected.
- D= Value derived from a 10 times dilution.
- J= Estimated value. Present, but less than the limit of quantitation.
- NR= No currently regulated amount.
- NA= Not applicable to this method. Concentrations are presented for screening purposes. For regulatory compliance, analyze using EPA method 504 which has lower detection limits.

REPORT COMMENTS: None

Analyst:   6        Reviewing Supervisor:   NTJ



Quality Control Sample: Laboratory Reagent Blank 10-JUN-1997 09:31

Report Date: 06/10/97 11:26

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /chem/IONTRAP2.1/vc061097.b/blk0610b.d

Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 524.2

VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====

-----REGULATED VOLATILE ORGANIC CHEMICALS (VOC'S)-----

Benzene	71-43-2	5	<0.50	U
Carbon Tetrachloride	56-23-5	5	<0.50	U
Chlorobenzene	108-90-7	100	<0.50	U
1,2-Dichlorobenzene	95-50-1	600	<0.50	U
1,4-Dichlorobenzene	106-46-7	75	<0.50	U
1,2-Dichloroethane	107-06-2	5	<0.50	U
1,1-Dichloroethene	75-35-4	7	<0.50	U
cis-1,2-Dichloroethene	156-59-2	70	<0.50	U
trans-1,2-Dichloroethene	156-60-5	100	<0.50	U
1,2-Dichloropropane	78-87-5	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Methylene Chloride	75-09-2	5	<0.50	U
Styrene	100-42-5	100	<0.50	U
Tetrachloroethene	127-18-4	5	<0.50	U
Toluene	108-88-3	1000	<0.50	U
1,2,4-Trichlorobenzene	120-82-1	70	<0.50	U
1,1,1-Trichloroethane	71-55-6	200	<0.50	U
1,1,2-Trichloroethane	79-00-5	5	<0.50	U
Trichloroethene	79-01-6	5	<0.50	U
Vinyl Chloride	75-01-4	2	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

-----REGULATED VOC'S: TRIHALOMETHANES-----

Bromodichloromethane	75-27-4	Total	<0.50	U
Bromoform	75-25-2	of all	<0.50	U
Chlorodibromomethane	124-48-1	four	<0.50	U
Chloroform	67-66-3	100	<0.50	U

-----OTHER EPA LISTED VOC'S-----

Bromobenzene	108-86-1	NR	<0.50	U
Bromochloromethane	74-97-5	NR	<0.50	U
Bromomethane	74-83-9	NR	<0.50	U
n-Butylbenzene	104-51-8	NR	<0.50	U
sec-Butylbenzene	135-98-8	NR	<0.50	U
tert-Butylbenzene	98-06-6	NR	<0.50	U
Chloroethane	75-00-3	NR	<0.50	U
Chloromethane	74-87-3	NR	<0.50	U
2-Chlorotoluene	95-49-8	NR	<0.50	U
4-Chlorotoluene	106-43-4	NR	<0.50	U
1,2-Dibromo-3-chloropropane	96-12-8	NA	<0.50	U

(report continued on page 2)

EPA METHOD 524.2  
VOLATILE ORGANICS ANALYSIS REPORT (continued)  
=====

CONCENTRATION UNITS = ug/L (ppb)				
COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
1,2-Dibromoethane	106-93-4	NA	<0.50	U
Dibromomethane	74-95-3	NR	<0.50	U
1,3-Dichlorobenzene	541-73-1	NR	<0.50	U
Dichlorodifluoromethane	75-71-8	NR	<0.50	U
1,1-Dichloroethane	75-34-3	NR	<0.50	U
1,1-Dichloropropene	563-58-6	NR	<0.50	U
1,3-Dichloropropane	142-28-9	NR	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	NR	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	NR	<0.50	U
2,2-Dichloropropane	594-20-7	NR	<0.50	U
Fluorotrichloromethane	75-69-4	NR	<0.50	U
Hexachlorobutadiene	87-68-3	NR	<0.50	U
Isopropylbenzene	98-82-8	NR	<0.50	U
p-Isopropyltoluene	99-87-6	NR	<0.50	U
Naphth ene	91-20-3	NR	<0.50	U
n-Propylbenzene	103-65-1	NR	<0.50	U
1,1,1,2-Tetrachloroethane	630-20-6	NR	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	NR	<0.50	U
1,2,3-Trichlorobenzene	87-61-6	NR	<0.50	U
1,2,3-Trichloropropane	96-18-4	NR	<0.50	U
1,2,4-Trimethylbenzene	95-63-6	NR	<0.50	U
1,3,5-Trimethylbenzene	108-67-8	NR	<0.50	U

SURROGATE RECOVERY REPORT				
Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.3	103	80--120
Toluene d8	10.0	10.1	101	80--120
p-Bromofluorobenzene	10.0	11.3	113	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

-U= Indicates compound was analyzed for but not detected.

NR= No currently regulated amount.

NA= Not applicable to this method. Concentrations are presented for screening purposes. For regulatory compliance, analyze using EPA method 504 which has lower detection limits.

REPORT COMMENTS: None

Analyst:   AJC        Reviewing Supervisor:   MTN



Quality Control Sample: Laboratory Reagent Blank 11-JUN-97 15:17

Report Date: 06/11/97 16:44

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /chem/5971A.i/va061197.b/jun110801008.d

Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 524.2

VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
-----REGULATED VOLATILE ORGANIC CHEMICALS (VOC'S)-----				
Benzene	71-43-2	5	<0.50	U
Carbon tetrachloride	56-23-5	5	<0.50	U
Chlorobenzene	108-90-7	100	<0.50	U
1,2-Dichlorobenzene	95-50-1	600	<0.50	U
1,4-Dichlorobenzene	106-46-7	75	<0.50	U
1,2-Dichloroethane	107-06-2	5	<0.50	U
1,1-Dichloroethene	75-35-4	7	<0.50	U
cis-1,2-Dichloroethene	156-59-2	70	<0.50	U
trans-1,2-Dichloroethene	156-60-5	100	<0.50	U
1,2-Dichloropropane	78-87-5	5	<0.50	U
Ethyl benzene	100-41-4	700	<0.50	U
Methylene chloride	75-09-2	5	<0.50	U
Styrene	100-42-5	100	<0.50	U
Tetrachloroethene	127-18-4	5	<0.50	U
Toluene	108-88-3	1000	<0.50	U
1,2,4-Trichlorobenzene	120-82-1	70	<0.50	U
1,1,1-Trichloroethane	71-55-6	200	<0.50	U
1,1,2-Trichloroethane	79-00-5	5	<0.50	U
Trichloroethene	79-01-6	5	<0.50	U
Vinyl chloride	75-01-4	2	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
2-Chloroethylvinyl ether	110-75-8		<0.50	U
Total Xylenes		10000	<0.50	U
-----REGULATED VOC'S: TRIHALOMETHANES-----				
Bromodichloromethane	75-27-4	Total	<0.50	U
Bromoform	75-25-2	of all	<0.50	U
Chlorodibromomethane	124-48-1	four	<0.50	U
Chloroform	67-66-3	100	<0.50	U
-----OTHER EPA LISTED VOC'S-----				
Bromobenzene	108-86-1	NR	<0.50	U
Bromochloromethane	74-97-5	NR	<0.50	U
Bromomethane	74-83-9	NR	<0.50	U
n-Butylbenzene	104-51-8	NR	<0.50	U
sec-Butylbenzene	135-98-8	NR	<0.50	U
tert-Butylbenzene	98-06-6	NR	<0.50	U
Chloroethane	75-00-3	NR	<0.50	U
Chloromethane	74-87-3	NR	<0.50	U
2-Chlorotoluene	95-49-8	NR	<0.50	U
4-Chlorotoluene	106-43-4	NR	<0.50	U

(report continued on page 2)

EPA METHOD 524.2  
VOLATILE ORGANICS ANALYSIS REPORT (continued)

=====

CONCENTRATION UNITS = ug/L

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
1,2-Dibromo-3-chloropropane	96-12-8	NA	<1.0	U
1,2-Dibromoethane	106-93-4	NA	<0.50	U
Dibromomethane	74-95-3	NR	<0.50	U
1,3-Dichlorobenzene	541-73-1	NR	<0.50	U
Dichlorodifluoromethane	75-71-8	NR	<0.50	U
1,1-Dichloroethane	75-34-3	NR	<0.50	U
1,1-Dichloropropene	563-58-6	NR	<0.50	U
1,3-Dichloropropane	142-28-9	NR	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	NR	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	NR	<0.50	U
2,2-Dichloropropane	594-20-7	NR	<0.50	U
Fluorotrichloromethane	75-69-4	NR	<0.50	U
Hexachlorobutadiene	87-68-3	NR	<0.50	U
Isopropylbenzene	98-82-8	NR	<0.50	U
p-Isopropyltoluene	99-87-6	NR	<0.50	U
Naphthalene	91-20-3	NR	<0.50	U
n-Propylbenzene	103-65-1	NR	<0.50	U
1,1,1,2-Tetrachloroethane	630-20-6	NR	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	NR	<0.50	U
1,2,3-Trichlorobenzene	87-61-6	NR	<0.50	U
1,2,3-Trichloropropane	96-18-4	NR	<0.50	U
1,2,4-Trimethylbenzene	95-63-6	NR	<0.50	U
1,3,5-Trimethylbenzene	108-67-8	NR	<0.50	U

----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.48	95	80--120
Toluene d8	10.0	9.79	98	80--120
p-Bromofluorobenzene	10.0	9.38	94	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

NR= No currently regulated amount.

NA= Not applicable to this method. Concentrations are presented for screening purposes. For regulatory compliance, analyze using EPA method 504 which has lower detection limits.

REPORT COMMENTS: None

Analyst:   6   Reviewing Supervisor:   MFB

Lab Nos.: 97-33048 - 97-33060

Date: 30-MAY-97

Received by: Pam Fink

Login Date: 02-JUN-97

Logged In by: Randa Hoelscher

### SAMPLE CONDITION QA/QC REPORT

This report provides information about the condition of the sample(s)  
and associated sample custody information on receipt at the laboratory.

Chain of Custody Form

Completed & Signed

Yes Comments: \_\_\_\_\_

Chain of Custody Seal

Yes Comments: \_\_\_\_\_

Intact

Yes Comments: \_\_\_\_\_

Signature Match Chain of Custody vs. Seal

Yes Comments: \_\_\_\_\_

Samples Received Cold

Yes Comments: \_\_\_\_\_

Samples Received Within Holding Time

Yes Comments: \_\_\_\_\_

Samples Received in Proper Containers

Yes Comments: \_\_\_\_\_

Samples Received Properly Preserved

N/A Comments: \_\_\_\_\_

Samples requiring analysis for volatile organics are tested for proper preservation at the time of analysis.  
Any preservation problems encountered for these samples are noted on the analytical parameter report pages.

Client notified about sample discrepancies:

Who: \_\_\_\_\_ By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Method of Shipping: Greyhound 150 736 642 1

Additional comments: \_\_\_\_\_



**ENERGY LABORATORIES, INC.**

P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325  
FAX (406) 252-6069 • 1-800-735-4489

June 23, 1997

Mike McKinsey  
Envirocon, Inc.  
P.O. Box 8243  
Missoula, MT 59807

Dear Mike:

On June 4, 1997, these samples, represented by our laboratory numbers 97-33460 through 97-33463, were submitted to our laboratory for analysis.

The test results and quality assurance were reviewed and approved by the undersigned.

Reviewed by: \_\_\_\_\_

A handwritten signature in black ink, appearing to read "A. S. Stedman", written over a horizontal line.

**ENERGY LABORATORIES, INC.**P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325  
FAX (406) 252-6069 • 1-800-735-4489

Client: Envirocon, Inc.  
Date Sampled: 02-JUN-97  
Date Received: 04-JUN-97  
Analysis Date: 14-JUN-1997 22:21  
File: /chem/5971A.1/va061497.b/jun141501015.d  
Project Info: LRY/BN  
Sample Info: 140101-1564

Lab No.: 97-33460  
Report Date: 06/18/97 09:42  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

89-3

**EPA METHOD 624****VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene chloride	75-09-2	<0.50	U
<b>Tetrachloroethene</b>	<b>127-18-4</b>	<b>163</b>	<b>D</b>
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
<b>Trichloroethene</b>	<b>79-01-6</b>	<b>0.97</b>	
Vinyl chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.52	85	80--120
Toluene d8	10.0	9.82	98	80--120
p-Bromofluorobenzene	10.0	10.5	105	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

D= Value was derived from a 20 times dilution.

REPORT COMMENTS: None

Analyst: 70x Reviewing Supervisor: MAN



Quality Control Sample: Laboratory Reagent Blank 14-JUN-1997 21:22  
Report Date: 06/18/97 09:42  
Extraction Method: EPA 5030  
Sample Matrix: WATER  
File: /chem/5971A.i/va061497.b/jun141401014.d  
Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT  
=====

CONCENTRATION UNITS = ug/L			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.24	92	80--120
Toluene d8	10.0	9.72	97	80--120
p-Bromofluorobenzene	10.0	10.4	104	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst:   ZJR        Reviewing Supervisor:   WJW





# ENERGY LABORATORIES, INC.

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## LABORATORY REPORT

Page: 1

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 97-33461 1m  
Date : 6/20/97

### GENERAL INFORMATION:

Laboratory No. : 97-33461  
Sample Type : WATER  
Sample Point : 140101-1565  
Sample Date : 6/03/97  
Sample Time :  
Sample Received : 6/04/97

L-88-10

### LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	48	6/11/97
Nitrogen,Nitrate.....(mg/l).....	0.34	6/06/97
Ferrous Iron.....(mg/l).....	<0.1	6/04/97
Methane.....(ppm).....	3	6/04/97



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## LABORATORY REPORT

Page: 1

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 97-33462 1m  
Date : 6/20/97

### GENERAL INFORMATION:

Laboratory No. : 97-33462  
Sample Type : WATER  
Sample Point : 140101-1566  
Sample Date : 6/03/97  
Sample Time :  
Sample Received : 6/04/97

L-87-3

### LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	125	6/11/97
Nitrogen,Nitrate.....(mg/l).....	3.88	6/06/97
Ferrous Iron.....(mg/l).....	<0.1	6/04/97
Methane.....(ppm).....	2	6/04/97

**ENERGY LABORATORIES, INC.**

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**LABORATORY REPORT**

Page: 1

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 97-33463 1m  
Date : 6/20/97

GENERAL INFORMATION:

Laboratory No. : 97-33463  
Sample Type : WATER  
Sample Point : 140101-1567  
Sample Date : 6/03/97  
Sample Time :  
Sample Received : 6/04/97

**L-87-1**LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	32	6/11/97
Nitrogen,Nitrate.....(mg/l).....	0.50	6/06/97
Ferrous Iron.....(mg/l).....	<0.1	6/04/97
Methane.....(ppm).....	2	6/04/97

ab No(s). 97-33461 - 97-33463

### QUALITY ASSURANCE DATA PACKAGE

This report includes the results of quality assurance tests performed with the sample analyses. They are performed to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate and precise results.

	Duplicate Analysis		Spiked Analysis	Blank Analysis,	Sample Analysis,	----- Reference ----- Accept Range	Date Analyzed
tituents	--- mg/l (ppm) --- Original	Duplicate	% Recovery	mg/l ppm	mg/l ppm	mg/l ppm	
ate	5020	5010	98	<1	325	286-350	11-JUN-97
ate as N	9.24	9.27	99	<0.05	1.49	1.35-1.68	06-JUN-97
<u>r Metal Analysis</u>							
+2	<0.1	<0.1	97	<0.1	N/A	N/A	04-JUN-97

Lab Nos.: 97-33460 - 97-33463

Date: 04-JUN-97

Received by: Randa Hoelscher

Logged In by: Randa Hoelscher

### SAMPLE CONDITION QA/QC REPORT

This report provides information about the condition of the sample(s)  
and associated sample custody information on receipt at the laboratory.

Chain of Custody Form Completed & Signed	<u>Yes</u>	Comments: _____
Chain of Custody Seal	<u>Yes</u>	Comments: _____
Intact	<u>Yes</u>	Comments: _____
Signature Match Chain of Custody vs. Seal	<u>No</u>	Comments: <u>Seal signed by John Mills.</u>
Samples Received Cold	<u>Yes</u>	Comments: _____
Samples Received Within Holding Time	<u>Yes</u>	Comments: _____
Samples Received in Proper Containers	<u>Yes</u>	Comments: _____
Samples Received Properly Preserved	<u>Yes</u>	Comments: _____

Samples requiring analysis for volatile organics are tested for proper preservation at the time of analysis.  
Any preservation problems encountered for these samples are noted on the analytical parameter report pages.

Client notified about sample discrepancies:

Who: \_\_\_\_\_ By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Method of Shipping: Greyhound 150 736 643 2

Additional comments: \_\_\_\_\_

PROJ. NO.		PROJECT NAME											
140101		LRY / B3											
SAMPLES: (Signature) <i>[Signature]</i> (400) 523-1500													
SAMPLED VOLUME	DATE	TIME	COMP.	GRAB	SAMPLE NUMBER	NO. OF CONTAINERS	601 Nitrate (NO <sub>3</sub> ) * Sulfate (SO <sub>4</sub> ) Methane Ferrous Iron (Fe <sup>2+</sup> )				REMARKS		
2-40ml	6/2/97				140101 - 1504	2	X					* Nitrate only	
	6/3/97				140101 - 1505	5		X	X	X	X		
	6/3/97				140101 - 1506	5		X	X	X	X		
	6/3/97				140101 - 1507	5		X	X	X	X		
Relinquished (Signature)						Date/Time	Received by: (Signature)	Relinquished by: (Signature)				Date/Time	Received by: (Signature)
Relinquished (Signature)						Date/Time	Received by: (Signature)	Relinquished by: (Signature)				Date/Time	Received by: (Signature)
Chain of Custody Seal:						Lab Personnel (receiving)		Remarks					
Intact (yes/no) <i>Intact</i>						Signature: <i>[Signature]</i>		Split Samples: <input type="checkbox"/> Accepted <input type="checkbox"/> Declined Signature:					





**ENERGY LABORATORIES, INC.**

P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325  
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June 24, 1997

Mike McKinsey  
Envirocon, Inc.  
P.O. Box 8243  
Missoula, MT 59807

Dear Mike:

On June 6, 1997, these samples, represented by our laboratory numbers 97-35820 through 97-35824, were submitted to our laboratory for analysis.

The test results and quality assurance were reviewed and approved by the undersigned.

Reviewed by: \_\_\_\_\_

A handwritten signature in dark ink, appearing to read "Joe Schindler", written over a horizontal line.

**ENERGY LABORATORIES, INC.**P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325  
FAX (406) 252-6069 • 1-800-735-4489

Client: Envirocon, Inc.

Date Sampled: 05-JUN-97 09:15

Date Received: 06-JUN-97

Analysis Date: 18-JUN-1997 01:14

File: /chem/IONTRAP2.1/vc061797.b/9735820a.d

Project Info: LRY/BN

Sample Info: 140101-1577

Lab No.: 97-35820

Report Date: 06/22/97 20:23

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.2	102	80--120
Toluene d8	10.0	9.51	95	80--120
p-Bromofluorobenzene	10.0	10.0	100	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: FJC Reviewing Supervisor: MSB

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Client: Envirocon, Inc.

Date Sampled: 05-JUN-97 09:15

Date Received: 06-JUN-97

Analysis Date: 20-JUN-1997 03:04

File: /chem/5971A.i/va061997.b/jun192401024.d

Project Info: LRY/BN

Sample Info: 140101-1577

Lab No.: 97-35820 DUPLICATE

Report Date: 06/20/97 14:22

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

*B-Street Lab Duplicate*

EPA METHOD 624

**VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.60	96	80--120
Toluene d8	10.0	7.52	75*	80--120
p-Bromofluorobenzene	10.0	10.6	106	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

\* = Surrogate recovery outside QC advisory limits.

REPORT COMMENTS: None

Analyst: CBReviewing Supervisor: MRB

Quality Control Sample: Laboratory Reagent Blank 17-JUN-1997 21:54

Report Date: 06/22/97 20:25

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /chem/IONTRAP2.i/vc061797.b/blk0617d.d

Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.8	108	80--120
Toluene d8	10.0	10.3	103	80--120
p-Bromofluorobenzene	10.0	9.83	98	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst:   JAC        Reviewing Supervisor:   WJM

**ENERGY LABORATORIES, INC.**

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FAX (406) 252-6069 • 1-800-735-4489

**LABORATORY REPORT**

Page: 1

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 97-35821 1m  
Date : 6/24/97

GENERAL INFORMATION:

Laboratory No. : 97-35821  
Sample Type : WATER  
Sample Point : 140101-1578  
Sample Date : 6/05/97  
Sample Time : 1120  
Sample Received : 6/06/97

*L-88-13*LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	43	6/11/97
Nitrate plus Nitrite as N.....(mg/l).....	0.35	6/11/97
Ferrous Iron.....(mg/l).....	<0.1	6/06/97
Methane in headspace.....(ppm).....	13	6/09/97



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FAX (406) 252-6069 • 1-800-735-4489**LABORATORY REPORT**

Page 1

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 97-35822 1m  
Date : 6/24/97

GENERAL INFORMATION:

Laboratory No. : 97-35822  
Sample Type : WATER  
Sample Point : 140101-1579  
Sample Date : 6/05/97  
Sample Time : 1220  
Sample Received : 6/06/97

**L-87-8**LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	33	6/11/97
Nitrate plus Nitrite as N.....(mg/l).....	0.26	6/11/97
Ferrous Iron.....(mg/l).....	1.3	6/06/97
Methane in headspace.....(ppm).....	180	6/09/97



**ENERGY LABORATORIES, INC.**

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**LABORATORY REPORT**

Page: 1

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 97-35823 1m  
Date : 6/24/97

GENERAL INFORMATION:

Laboratory No. : 97-35823  
Sample Type : WATER  
Sample Point : 140101-1580  
Sample Date : 6/05/97  
Sample Time : 1355  
Sample Received : 6/06/97

**L-87-7**LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	20	6/11/97
Nitrate plus Nitrite as N.....(mg/l).....	0.08	6/11/97
Ferrous Iron.....(mg/l).....	0.4	6/06/97
Methane in headspace.....(ppm).....	4220	6/09/97

**ENERGY LABORATORIES, INC.**P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325  
FAX (406) 252-6069 • 1-800-735-4489**LABORATORY REPORT**

Page: 1

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 97-35824 1m  
Date : 6/24/97

GENERAL INFORMATION:

Laboratory No. : 97-35824  
Sample Type : WATER  
Sample Point : 140101-1581  
Sample Date : 6/05/97  
Sample Time :  
Sample Received : 6/06/97

**L-87-5**LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	63	6/11/97
Nitrate plus Nitrite as N.....(mg/l).....	1.65	6/11/97
Ferrous Iron.....(mg/l).....	<0.1	6/06/97
Methane in headspace.....(ppm).....	2	6/09/97

Lab No(s). 97-35821 - 97-35824

### QUALITY ASSURANCE DATA PACKAGE

This report includes the results of quality assurance tests performed with the sample analyses. They are performed to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate and precise results.

Constituents	Duplicate Analysis		Spiked	Blank	Sample	Reference	Date Analyzed
	--- mg/l (ppm) ---	---	Analysis	Analysis,	Analysis,	Accept	
	Original	Duplicate	% Recovery	mg/l ppm	mg/l ppm	Range mg/l ppm	
Sulfate	1	2	107	<1	325	286-350	11-JUN-97
Nitrate plus Nitrite as N	1.04	1.04	96	<0.05	1.14	1.02-1.28	11-JUN-97
<u>Other Metal Analysis</u>							
Iron +2	<0.1	<0.1	96	<0.1	N/A	N/A	06-JUN-97

Lab Nos.: 97-35820 - 97-35824

Date: 06-JUN-97

Received by: Randa Hoelscher

Logged In by: Randa Hoelscher

### SAMPLE CONDITION QA/QC REPORT

This report provides information about the condition of the sample(s)  
and associated sample custody information on receipt at the laboratory.

Chain of Custody Form Completed & Signed	<u>Yes</u>	Comments: _____
Chain of Custody Seal	<u>Yes</u>	Comments: _____
Intact	<u>Yes</u>	Comments: _____
Signature Match Chain of Custody vs. Seal	<u>Yes</u>	Comments: _____
Samples Received Cold	<u>Yes</u>	Comments: _____
Samples Received Within Holding Time	<u>Yes</u>	Comments: _____
Samples Received in Proper Containers	<u>Yes</u>	Comments: _____
Samples Received Properly Preserved	<u>Yes</u>	Comments: _____

Samples requiring analysis for volatile organics are tested for proper preservation at the time of analysis.  
Any preservation problems encountered for these samples are noted on the analytical parameter report pages.

Client notified about sample discrepancies:

Who: \_\_\_\_\_ By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Method of Shipping: Greyhound 130 359 311 5

Additional comments: \_\_\_\_\_





**ENERGY LABORATORIES, INC.**

P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325  
FAX (406) 252-6069 • 1-800-735-4489

June 25, 1997

Mike McKinsey  
Envirocon, Inc.  
P.O. Box 8243  
Missoula, MT 59807

Dear Mike:

On June 5, 1997, these samples, represented by our laboratory numbers 97-33557 through 97-33565, were submitted to our laboratory for analysis.

The test results and quality assurance were reviewed and approved by the undersigned.

Reviewed by: \_\_\_\_\_

A handwritten signature in dark ink, appearing to read "J. A. Shuler", written over a horizontal line.



**ENERGY LABORATORIES, INC.**P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325  
FAX (406) 252-6069 • 1-800-735-4489**LABORATORY REPORT**

Page: 1

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 97-33557 1m  
Date : 6/24/97

GENERAL INFORMATION:

Laboratory No. : 97-33557  
Sample Type : WATER  
Sample Point : 140101-1568 89-9  
Sample Date : 6/03/97  
Sample Time :  
Sample Received : 6/05/97

LABORATORY DATA:

	Result		Date Analyzed
Carbon tetrachloride.....(µg/L).....	<0.50	U	6/15/97
Chlorobenzene.....(µg/L).....	<0.50	U	6/15/97
1,2-Dichlorobenzene.....(µg/L).....	<0.50	U	6/15/97
1,4-Dichlorobenzene.....(µg/L).....	<0.50	U	6/15/97
1,2-Dichloroethane.....(µg/L).....	<0.50	U	6/15/97
1,1-Dichloroethene.....(µg/L).....	<0.50	U	6/15/97
cis-1,2-Dichloroethene.....(µg/L).....	3.2		6/15/97
trans-1,2-Dichloroethene.....(µg/L).....	<0.50	U	6/15/97
1,2-Dichloropropane.....(µg/L).....	<0.50	U	6/15/97
Methylene chloride.....(µg/L).....	0.90		6/15/97
Tetrachloroethene.....(µg/L).....	69	D	6/15/97
1,1,1-Trichloroethane.....(µg/L).....	<0.50	U	6/15/97
1,1,2-Trichloroethane.....(µg/L).....	<0.50	U	6/15/97
Trichloroethene.....(µg/L).....	5.6		6/15/97
Vinyl chloride.....(µg/L).....	<0.50	U	6/15/97
2-Chloroethylvinyl ether.....(µg/L).....	<0.50	U	6/15/97
Bromodichloromethane.....(µg/L).....	<0.50	U	6/15/97
Bromoform.....(µg/L).....	<0.50	U	6/15/97
Chlorodibromomethane.....(µg/L).....	<0.50	U	6/15/97
Chloroform.....(µg/L).....	<0.50	U	6/15/97
Bromomethane.....(µg/L).....	<0.50	U	6/15/97
Chloroethane.....(µg/L).....	<0.50	U	6/15/97
Chloromethane.....(µg/L).....	<0.50	U	6/15/97
2-Chlorotoluene.....(µg/L).....	<0.50	U	6/15/97
1,3-Dichlorobenzene.....(µg/L).....	<0.50	U	6/15/97
Dichlorodifluoromethane.....(µg/L).....	<0.50	U	6/15/97

# LABORATORY REPORT

Page: 2

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 97-33557 1m  
Date : 6/24/97

## GENERAL INFORMATION:

Laboratory No. : 97-33557  
Sample Type : WATER  
Sample Point : 140101-1568  
Sample Date : 6/03/97  
Sample Time :  
Sample Received : 6/05/97

## LABORATORY DATA:

	Result		Date Analyzed
1,1-Dichloroethane.....( $\mu\text{g/L}$ ).....	<0.50	U	6/15/97
cis-1,3-Dichloropropene.....( $\mu\text{g/L}$ ).....	<0.50	U	6/15/97
trans-1,3-Dichloropropene.....( $\mu\text{g/L}$ ).....	<0.50	U	6/15/97
Fluorotrichloromethane.....( $\mu\text{g/L}$ ).....	<0.50	U	6/15/97
1,1,2,2-Tetrachloroethane.....( $\mu\text{g/L}$ ).....	<0.50	U	6/15/97

D Value was derived from a 10 times dilution.  
U Indicates compound was analyzed for but not detected.

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FAX (406) 252-6069 • 1-800-735-4489**LABORATORY REPORT**

Page: 1

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 97-33558 1m  
Date : 6/24/97

GENERAL INFORMATION:

Laboratory No. : 97-33558  
Sample Type : WATER  
Sample Point : 140101-1569  
Sample Date : 6/03/97  
Sample Time :  
Sample Received : 6/05/97

*89-9 Field duplicate*LABORATORY DATA:

	Result		Date Analyzed
Carbon tetrachloride.....(µg/L).....	<0.50	U	6/15/97
Chlorobenzene.....(µg/L).....	<0.50	U	6/15/97
1,2-Dichlorobenzene.....(µg/L).....	<0.50	U	6/15/97
1,4-Dichlorobenzene.....(µg/L).....	<0.50	U	6/15/97
1,2-Dichloroethane.....(µg/L).....	<0.50	U	6/15/97
1,1-Dichloroethene.....(µg/L).....	<0.50	U	6/15/97
cis-1,2-Dichloroethene.....(µg/L).....	3.2		6/15/97
trans-1,2-Dichloroethene.....(µg/L).....	<0.50	U	6/15/97
1,2-Dichloropropane.....(µg/L).....	<0.50	U	6/15/97
Methylene chloride.....(µg/L).....	0.94	U	6/15/97
Tetrachloroethene.....(µg/L).....	69	D	6/15/97
1,1,1-Trichloroethane.....(µg/L).....	<0.50	U	6/15/97
1,1,2-Trichloroethane.....(µg/L).....	<0.50	U	6/15/97
Trichloroethene.....(µg/L).....	5.7		6/15/97
Vinyl chloride.....(µg/L).....	<0.50	U	6/15/97
2-Chloroethylvinyl ether.....(µg/L).....	<0.50	U	6/15/97
Bromodichloromethane.....(µg/L).....	<0.50	U	6/15/97
Bromoform.....(µg/L).....	<0.50	U	6/15/97
Chlorodibromomethane.....(µg/L).....	<0.50	U	6/15/97
Chloroform.....(µg/L).....	<0.50	U	6/15/97
Bromomethane.....(µg/L).....	<0.50	U	6/15/97
Chloroethane.....(µg/L).....	<0.50	U	6/15/97
Chloromethane.....(µg/L).....	<0.50	U	6/15/97
2-Chlorotoluene.....(µg/L).....	<0.50	U	6/15/97
1,3-Dichlorobenzene.....(µg/L).....	<0.50	U	6/15/97
Dichlorodifluoromethane.....(µg/L).....	<0.50	U	6/15/97

# LABORATORY REPORT

Page: 2

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 97-33558 1m  
Date : 6/24/97

## GENERAL INFORMATION:

Laboratory No. : 97-33558  
Sample Type : WATER  
Sample Point : 140101-1569  
Sample Date : 6/03/97  
Sample Time :  
Sample Received : 6/05/97

## LABORATORY DATA:

	Result		Date Analyzed
1,1-Dichloroethane.....( $\mu\text{g/L}$ ).....	<0.50	U	6/15/97
cis-1,3-Dichloropropene.....( $\mu\text{g/L}$ ).....	<0.50	U	6/15/97
trans-1,3-Dichloropropene.....( $\mu\text{g/L}$ ).....	<0.50	U	6/15/97
Fluorotrichloromethane.....( $\mu\text{g/L}$ ).....	<0.50	U	6/15/97
1,1,2,2-Tetrachloroethane.....( $\mu\text{g/L}$ ).....	<0.50	U	6/15/97

D Value was derived from a 10 times dilution.  
U Indicates compound was analyzed for but not detected.

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Page: 1

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 97-33559 1m  
Date : 6/24/97

GENERAL INFORMATION:

Laboratory No. : 97-33559  
Sample Type : WATER  
Sample Point : 140101-1572  
Sample Date : 6/04/97  
Sample Time :  
Sample Received : 6/05/97

*Trip blank*LABORATORY DATA:

	Result		Date Analyzed
Carbon tetrachloride.....(µg/L).....	<0.50	U	6/17/97
Chlorobenzene.....(µg/L).....	<0.50	U	6/17/97
1,2-Dichlorobenzene.....(µg/L).....	<0.50	U	6/17/97
1,4-Dichlorobenzene.....(µg/L).....	<0.50	U	6/17/97
1,2-Dichloroethane.....(µg/L).....	<0.50	U	6/17/97
1,1-Dichloroethane.....(µg/L).....	<0.50	U	6/17/97
cis-1,2-Dichloroethane.....(µg/L).....	<0.50	U	6/17/97
trans-1,2-Dichloroethane.....(µg/L).....	<0.50	U	6/17/97
1,2-Dichloropropane.....(µg/L).....	<0.50	U	6/17/97
Methylene chloride.....(µg/L).....	<0.50	U	6/17/97
Tetrachloroethene.....(µg/L).....	<0.50	U	6/17/97
1,1,1-Trichloroethane.....(µg/L).....	<0.50	U	6/17/97
1,1,2-Trichloroethane.....(µg/L).....	<0.50	U	6/17/97
Trichloroethene.....(µg/L).....	<0.50	U	6/17/97
Vinyl chloride.....(µg/L).....	<0.50	U	6/17/97
2-Chloroethylvinyl ether.....(µg/L).....	<0.50	U	6/17/97
Bromodichloromethane.....(µg/L).....	<0.50	U	6/17/97
Bromoform.....(µg/L).....	<0.50	U	6/17/97
Chlorodibromomethane.....(µg/L).....	<0.50	U	6/17/97
Chloroform.....(µg/L).....	<0.50	U	6/17/97
Bromomethane.....(µg/L).....	<0.50	U	6/17/97
Chloroethane.....(µg/L).....	<0.50	U	6/17/97
Chloromethane.....(µg/L).....	<0.50	U	6/17/97
2-Chlorotoluene.....(µg/L).....	<0.50	U	6/17/97
1,3-Dichlorobenzene.....(µg/L).....	<0.50	U	6/17/97
Dichlorodifluoromethane.....(µg/L).....	<0.50	U	6/17/97

# LABORATORY REPORT

Page: 2

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 97-33559 1m  
Date : 6/24/97

## GENERAL INFORMATION:

Laboratory No. : 97-33559  
Sample Type : WATER  
Sample Point : 140101-1572  
Sample Date : 6/04/97  
Sample Time :  
Sample Received : 6/05/97

## LABORATORY DATA:

	Result		Date Analyzed
1,1-Dichloroethane.....( $\mu\text{g/L}$ ).....	<0.50	U	6/17/97
cis-1,3-Dichloropropene.....( $\mu\text{g/L}$ ).....	<0.50	U	6/17/97
trans-1,3-Dichloropropene.....( $\mu\text{g/L}$ ).....	<0.50	U	6/17/97
Fluorotrichloromethane.....( $\mu\text{g/L}$ ).....	<0.50	U	6/17/97
1,1,2,2-Tetrachloroethane.....( $\mu\text{g/L}$ ).....	<0.50	U	6/17/97

U Indicates compound was analyzed for but not detected.



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Page: 1

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 97-33560 1m  
Date : 6/24/97

GENERAL INFORMATION:

Laboratory No. : 97-33560  
Sample Type : WATER  
Sample Point : 140101-1570  
Sample Date : 6/04/97  
Sample Time :  
Sample Received : 6/05/97

89-2

LABORATORY DATA:

	Result		Date Analyzed
Carbon tetrachloride.....(µg/L).....	<0.50	U	6/17/97
Chlorobenzene.....(µg/L).....	<0.50	U	6/17/97
1,2-Dichlorobenzene.....(µg/L).....	<0.50	U	6/17/97
1,4-Dichlorobenzene.....(µg/L).....	<0.50	U	6/17/97
1,2-Dichloroethane.....(µg/L).....	<0.50	U	6/17/97
1,1-Dichloroethene.....(µg/L).....	<0.50	U	6/17/97
cis-1,2-Dichloroethene.....(µg/L).....	<0.50	U	6/17/97
trans-1,2-Dichloroethene.....(µg/L).....	<0.50	U	6/17/97
1,2-Dichloropropane.....(µg/L).....	<0.50	U	6/17/97
Methylene chloride.....(µg/L).....	<0.50	U	6/17/97
Tetrachloroethene.....(µg/L).....	<0.50	U	6/17/97
1,1,1-Trichloroethane.....(µg/L).....	<0.50	U	6/17/97
1,1,2-Trichloroethane.....(µg/L).....	<0.50	U	6/17/97
Trichloroethene.....(µg/L).....	<0.50	U	6/17/97
Vinyl chloride.....(µg/L).....	<0.50	U	6/17/97
2-Chloroethylvinyl ether.....(µg/L).....	<0.50	U	6/17/97
Bromodichloromethane.....(µg/L).....	<0.50	U	6/17/97
Bromoform.....(µg/L).....	<0.50	U	6/17/97
Chlorodibromomethane.....(µg/L).....	<0.50	U	6/17/97
Chloroform.....(µg/L).....	<0.50	U	6/17/97
Bromomethane.....(µg/L).....	<0.50	U	6/17/97
Chloroethane.....(µg/L).....	<0.50	U	6/17/97
Chloromethane.....(µg/L).....	<0.50	U	6/17/97
2-Chlorotoluene.....(µg/L).....	<0.50	U	6/17/97
1,3-Dichlorobenzene.....(µg/L).....	<0.50	U	6/17/97
Dichlorodifluoromethane.....(µg/L).....	<0.50	U	6/17/97

## LABORATORY REPORT

Page: 2

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 97-33560 1m  
Date : 6/24/97

### GENERAL INFORMATION:

Laboratory No. : 97-33560  
Sample Type : WATER  
Sample Point : 140101-1570  
Sample Date : 6/04/97  
Sample Time :  
Sample Received : 6/05/97

### LABORATORY DATA:

	Result		Date Analyzed
1,1-Dichloroethane.....( $\mu\text{g/L}$ ).....	<0.50	U	6/17/97
cis-1,3-Dichloropropene.....( $\mu\text{g/L}$ ).....	<0.50	U	6/17/97
trans-1,3-Dichloropropene.....( $\mu\text{g/L}$ ).....	<0.50	U	6/17/97
Fluorotrichloromethane.....( $\mu\text{g/L}$ ).....	<0.50	U	6/17/97
1,1,2,2-Tetrachloroethane.....( $\mu\text{g/L}$ ).....	<0.50	U	6/17/97

U Indicates compound was analyzed for but not detected.

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Page: 1

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 33560 1m  
Date : 6/26/97

GENERAL INFORMATION:

Laboratory No. : 33560  
Sample Type : WATER  
Sample Point : 140101-1570  
Sample Date : 6/04/97  
Sample Time :  
Sample Received : 6/05/97

89-2

LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	60	6/11/97
Nitrate plus Nitrite as N.....(mg/l).....	1.61	6/06/97
Ferrous Iron.....(mg/l).....	<0.1	6/05/97
Methane in headspace.....(ppm).....	2	6/06/97



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**LABORATORY REPORT**

Page: 1

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 97-33561 1m  
Date : 6/24/97

GENERAL INFORMATION:

Laboratory No. : 97-33561  
Sample Type : WATER  
Sample Point : 140101-1571 L-87-2  
Sample Date : 6/04/97  
Sample Time :  
Sample Received : 6/05/97

LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	61	6/11/97
Nitrate plus Nitrite as N.....(mg/l).....	0.66	6/06/97
Ferrous Iron.....(mg/l).....	0.8	6/05/97
Methane in headspace.....(ppm).....	1620	6/06/97



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**LABORATORY REPORT**

Page: 1

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 97-33562 1m  
Date : 6/25/97

GENERAL INFORMATION:

Laboratory No. : 97-33562  
Sample Type : WATER  
Sample Point : 140101-1573 L-88-13  
Sample Date : 6/04/97  
Sample Time :  
Sample Received : 6/05/97

LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	43	6/11/97
Nitrate plus Nitrite as N.....(mg/l).....	0.37	6/06/97
Ferrous Iron.....(mg/l).....	<0.1	6/05/97
Methane in headspace.....(ppm).....	11	6/06/97

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**LABORATORY REPORT**

Page: 1

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 97-33563 1m  
Date : 6/25/97

GENERAL INFORMATION:

Laboratory No. : 97-33563  
Sample Type : WATER  
Sample Point : 140101-1574  
Sample Date : 6/04/97  
Sample Time :  
Sample Received : 6/05/97

92-3

LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	42	6/11/97
Nitrate plus Nitrite as N.....(mg/l).....	1.02	6/06/97
Ferrous Iron.....(mg/l).....	<0.1	6/05/97
Methane in headspace.....(ppm).....	3	6/06/97



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**LABORATORY REPORT**

Page: 1

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 97-33564 1m  
Date : 6/25/97

GENERAL INFORMATION:

Laboratory No. : 97-33564  
Sample Type : WATER  
Sample Point : 140101-1575  
Sample Date : 6/04/97  
Sample Time :  
Sample Received : 6/05/97

95-1

LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	42	6/11/97
Nitrate plus Nitrite as N.....(mg/l).....	1.02	6/06/97
Ferrous Iron.....(mg/l).....	<0.1	6/05/97
Methane in headspace.....(ppm).....	2	6/06/97

**ENERGY LABORATORIES, INC.**

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**LABORATORY REPORT**

Page: 1

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 8243  
Missoula, MT 59807

Lab No. : 97-33565 1m  
Date : 6/25/97

GENERAL INFORMATION:

Laboratory No. : 97-33565  
Sample Type : WATER  
Sample Point : 140101-1576  
Sample Date : 6/04/97  
Sample Time :  
Sample Received : 6/05/97

*L-87-4*LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	45	6/11/97
Nitrate plus Nitrite as N.....(mg/l).....	0.69	6/06/97
Ferrous Iron.....(mg/l).....	<0.1	6/05/97
Methane in headspace.....(ppm).....	50	6/06/97

Lab No(s) . 97-33560 - 97-33565

### QUALITY ASSURANCE DATA PACKAGE

This report includes the results of quality assurance tests performed with the sample analyses. They are performed to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate and precise results.

Constituents	Duplicate Analysis		Spiked	----- Reference -----			Date Analyzed
	--- mg/l (ppm) ---		Analysis	Blank	Sample	Accept	
	Original Duplicate		% Recovery	Analysis, mg/l ppm	Analysis, mg/l ppm	Range mg/l ppm	
Sulfate	5020	5010	98	<1	325	286-350	11-JUN-97
Nitrate plus Nitrite as N	0.12	0.12	90	<0.05	1.49	1.35-1.68	06-JUN-97
<u>Other Metal Analysis</u>							
Iron +2	<0.1	<0.1	95	<0.1	N/A	N/A	05-JUN-97

Lab Nos.: 97-33557 - 97-33565

Date: 05-JUN-97

Received by: Randa Hoelscher

Logged In by: Randa Hoelscher

## SAMPLE CONDITION QA/QC REPORT

This report provides information about the condition of the sample(s)  
and associated sample custody information on receipt at the laboratory.

Chain of Custody Form Completed & Signed	<u>Yes</u>	Comments: _____
Chain of Custody Seal	<u>No</u>	Comments: _____
Intact	<u>N/A</u>	Comments: _____
Signature Match Chain of Custody vs. Seal	<u>N/A</u>	Comments: _____
Samples Received Cold	<u>Yes</u>	Comments: _____
Samples Received Within Holding Time	<u>Yes</u>	Comments: _____
Samples Received in Proper Containers	<u>Yes</u>	Comments: _____
Samples Received Properly Preserved	<u>Yes</u>	Comments: _____

Samples requiring analysis for volatile organics are tested for proper preservation at the time of analysis.  
Any preservation problems encountered for these samples are noted on the analytical parameter report pages.

Client notified about sample discrepancies:

Who: \_\_\_\_\_ By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Method of Shipping: Greyhound 150 736 644 3

Additional comments: \_\_\_\_\_

[illegible]





**ENERGY LABORATORIES, INC.**

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July 8, 1997

Envirocon, Inc.  
P.O. Box 8243  
Missoula, MT 59807

On June 19, 1997, these samples, represented by our laboratory numbers 97-38471 through 97-38472, were submitted to our laboratory for analysis.

The test results and quality assurance were reviewed and approved by the undersigned.

Reviewed by:

A handwritten signature in black ink, appearing to read "Deborah C. Gurnea". The signature is written over a horizontal line.

pc: John Mills, Bozeman, MT



**ENERGY LABORATORIES, INC.**P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325  
FAX (406) 252-6069 • 1-800-735-4489

Client: Envirocon, Inc.  
Date Sampled: 18-JUN-97  
Date Received: 19-JUN-97  
Analysis Date: 30-JUN-1997 19:21  
File: /chem/IONTRAP2.1/vc063097.b/9738471a.d  
Project Info: BN Livingston  
Sample Info: 140101-1582

Lab No.: 97-38471  
Report Date: 07/02/97 11:31  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

92-4  
**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	0.25J
Tetrachloroethene	127-18-4	2.4	
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	0.38J
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.65	97	80--120
Toluene d8	10.0	8.33	83	80--120
p-Bromofluorobenzene	10.0	10.2	102	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: 7Jc Reviewing Supervisor: OMB

**ENERGY LABORATORIES, INC.**P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325  
FAX (406) 252-6069 • 1-800-735-4489

Client: Envirocon, Inc.  
Date Sampled: 18-JUN-97  
Date Received: 19-JUN-97  
Analysis Date: 30-JUN-1997 20:06  
File: /chem/IONTRAP2.1/vc063097.b/9738472a.d  
Project Info: BN Livingston  
Sample Info: 140101-1583

Lab No.: 97-38472  
Report Date: 07/02/97 11:31  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

# 2

**EPA METHOD 624****VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
<b>Tetrachloroethene</b>	<b>127-18-4</b>	<b>&lt;0.50</b>	<b>0.25J</b>
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.53	95	80--120
Toluene d8	10.0	9.40	94	80--120
p-Bromofluorobenzene	10.0	10.1	101	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: ZJC Reviewing Supervisor: MD

Quality Control Sample: Laboratory Reagent Blank 30-JUN-1997 11:45

Report Date: 07/02/97 11:27

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /chem/IONTRAP2.i/vc063097.b/blk0630a.d

Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 624

VOLATILE ORGANICS ANALYSIS REPORT

=====

COMPOUNDS	CAS NO.	CONCENTRATION UNITS = ug/L (ppb)	RESULT	QUALIFIER
=====	=====		=====	=====
Carbon Tetrachloride	56-23-5		<0.50	U
Chlorobenzene	108-90-7		<0.50	U
1,2-Dichlorobenzene	95-50-1		<0.50	U
1,4-Dichlorobenzene	106-46-7		<0.50	U
1,2-Dichloroethane	107-06-2		<0.50	U
1,1-Dichloroethene	75-35-4		<0.50	U
cis-1,2-Dichloroethene	156-59-2		<0.50	U
trans-1,2-Dichloroethene	156-60-5		<0.50	U
1,2-Dichloropropane	78-87-5		<0.50	U
Methylene Chloride	75-09-2		<0.50	U
Tetrachloroethene	127-18-4		<0.50	U
1,1,1-Trichloroethane	71-55-6		<0.50	U
1,1,2-Trichloroethane	79-00-5		<0.50	U
Trichloroethene	79-01-6		<0.50	U
Vinyl Chloride	75-01-4		<0.50	U
2-Chloroethylvinyl ether	110-75-8		<0.50	U
Bromodichloromethane	75-27-4		<0.50	U
Bromoform	75-25-2		<0.50	U
Chlorodibromomethane	124-48-1		<0.50	U
Chloroform	67-66-3		<0.50	U
Bromomethane	74-83-9		<0.50	U
Chloroethane	75-00-3		<0.50	U
Chloromethane	74-87-3		<0.50	U
2-Chlorotoluene	95-49-8		<0.50	U
1,3-Dichlorobenzene	541-73-1		<0.50	U
Dichlorodifluoromethane	75-71-8		<0.50	U
1,1-Dichloroethane	75-34-3		<0.50	U
cis-1,3-Dichloropropene	10061-01-5		<0.50	U
trans-1,3-Dichloropropene	10061-02-6		<0.50	U
Fluorotrichloromethane	75-69-4		<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5		<0.50	U

----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.26	93	80--120
Toluene d8	10.0	9.94	99	80--120
p-Bromofluorobenzene	10.0	10.8	108	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: 7/8 Reviewing Supervisor: 7/8

# EPA METHOD 624 MATRIX SPIKE REPORT

=====

Quality Control Sample: Matrix Spike Analysis 01-JUL-1997 20:44

Lab No.: 97-38471

Report Date: 07/02/97 08:53

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /chem/IONTRAP2.i/vc070197.b/9738471s.d

Remarks: These compounds were spiked into the sample matrix to determine if the sample matrix contributes bias to the analytical results and to monitor the accuracy of the methodology.

CONCENTRATION UNITS = ug/L (ppb)

Spike Compound	Spike Added	Sample Concentration	Matrix Spike Concentration	MS %Rec	QC Limits
Chlorobenzene	5.00	<0.500	5.05	101	60--140
1,1-Dichloroethene	5.00	<0.500	4.69	94	60--140
Trichloroethene	5.00	<0.500	4.98	100	60--140

REPORT COMMENTS: None

Analyst: HJC      Reviewing Supervisor: RN





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## LABORATORY REPORT

Page: 1

To : Envirocon, Inc.  
Address : P.O. Box 8243  
Missoula, MT 59807

Lab No. : 38472 1m  
Date : 7/08/97

### GENERAL INFORMATION:

Laboratory No. : 38472  
Sample Type : WATER  
Sample Point : 140101-1583 #2  
Sample Date : 6/18/97  
Sample Time :  
Sample Received : 6/19/97

### LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	48	6/21/97
Nitrogen,Nitrate.....(mg/l).....	1.76	6/19/97
Ferrous Iron.....(mg/l).....	<0.1	6/19/97
Methane in headspace.....(ppm).....	2	6/20/97

pc: John Mills, Bozeman, MT

Lab No(s) . 97-38472 - 97-38472

### QUALITY ASSURANCE DATA PACKAGE

This report includes the results of quality assurance tests performed with the sample analyses. They are performed to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate and precise results.

Constituents	Duplicate Analysis		Spiked	Blank	Sample	----- Reference -----	Date Analyzed
	--- mg/l (ppm) ---		Analysis	Analysis,	Analysis,	Accept	
			%			Range	
	Original	Duplicate	Recovery	mg/l ppm	mg/l ppm	mg/l ppm	
Sulfate	3010	3030	94	<1	328	286-350	21-JUN-97
Nitrate as N	<0.05	<0.05	86	<0.05	2.33	2.04-2.56	19-JUN-97
<u>Mercury Metal Analysis</u>							
Mer +2	<0.1	<0.1	100	<0.1	N/A	N/A	19-JUN-97



Lab Nos.: 97-38471 - 97-38472

Date: 19-JUN-97

Received by: Randa Hoelscher

Logged In by: Randa Hoelscher

### SAMPLE CONDITION QA/QC REPORT

This report provides information about the condition of the sample(s)  
and associated sample custody information on receipt at the laboratory.

Chain of Custody Form Completed & Signed	<u>Yes</u>	Comments: _____
Chain of Custody Seal	<u>No</u>	Comments: _____
Intact	<u>N/A</u>	Comments: _____
Signature Match Chain of Custody vs. Seal	<u>N/A</u>	Comments: _____
Samples Received Cold	<u>Yes</u>	Comments: _____
Samples Received Within Holding Time	<u>Yes</u>	Comments: _____
Samples Received in Proper Containers	<u>Yes</u>	Comments: _____
Samples Received Properly Preserved	<u>Yes</u>	Comments: _____

Samples requiring analysis for volatile organics are tested for proper preservation at the time of analysis.  
Any preservation problems encountered for these samples are noted on the analytical parameter report pages.

Client notified about sample discrepancies:

Who: \_\_\_\_\_ By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Method of Shipping: Greyhound 152 741 190 8

Additional comments: \_\_\_\_\_

**MAY 1997**

**MDEQ SPLIT SAMPLE RESULTS**



DEPARTMENT OF PUBLIC HEALTH AND HUMAN SERVICES  
LABORATORY SERVICES BUREAUPO BOX 6489  
HELENA MT 59604  
FAX: 406-444-1802  
PHONE: 406-444-2642

## FACSIMILE TRANSMITTAL

TO: JOHN WADNAMSFAX NUMBER: 1901

FROM: PUBLIC HEALTH LAB

DATE: 6/24/97NUMBER OF PAGES: 43  
INCLUDING THIS ONE

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STATE OF MONTANA  
DEPARTMENT OF PUBLIC HEALTH AND HUMAN SERVICES  
COGSWELL BUILDING  
HELENA MONTANA, 59620-0901

LABORATORY SYSTEM

ACCOUNT: SHW00002 ATTN: JOHN WADHAMS  
RC NR:

DEQ ENVIORNMENTAL REMEDIATION BUREAU 2  
PO BOX 200901  
HELENA MT 59620-0000

GIN DATE: 06/02/97 TIME: 11:48 BY: DRM SAMPLE ID: L-87-3  
LATITUDE: STORET ID:  
LONGITUDE: LEGAL DESCRIPTION:

LEGAL TEXT:  
SITE DESCRIPTION:

MP: C/F: FLOW: UNITS: METHOD: CONDUCTIVITY:  
STAFF GUAGE HT: DISSOLVED O2: MG/L TURBIDITY: NTU  
ELD COMMENTS: WATER USAGE: <----->

\*\*\*CHEM LAB SAMPLE REPORT\*\*\*

June 24, 1997

b#	testid	collect date	collect time by	collect method agency	reported	units
706-101777	VOC	05/29/97	0930 JOHN W.		ATTACHED	UG/L

PROVED BY:

DB

\*FOR QUESTIONS CONCERNING THIS ANALYSIS CALL: 406-444-2642



STATE OF MONTANA  
DEPARTMENT OF PUBLIC HEALTH AND HUMAN SERVICES  
COGSWELL BUILDING  
HELENA MONTANA, 59620-0901

LABORATORY SYSTEM

ACCOUNT: SHW00002 ATTN: JOHN WADHAMS  
RC NR:

DEQ ENVIORNMENTAL REMEDIATION BUREAU 2  
PO BOX 200901  
HELENA MT 59620-0000

LOGIN DATE: 06/02/97 TIME: 11:51 BY: DRM  
LATITUDE:  
LONGITUDE:

SAMPLE ID: WELL 3  
STORET ID:  
LEGAL DESCRIPTION:

LEGAL TEXT:  
SITE DESCRIPTION:

TEMP:	C/F:	FLOW:	UNITS:	METHOD:	CONDUCTIVITY:
PH:	STAFF GUAGE HT:	DISSOLVED O2:	MG/L	TURBIDITY:	NTU
FIELD COMMENTS:		WATER USAGE: <----->			

\*\*\*CHEM LAB SAMPLE REPORT\*\*\*

June 24, 199

lab#	testid	collect date	collect time by	collect method agency	reported	units
C9706-101778	VOC	05/29/97	1205 JOHN W.		ATTACHED	UG/L

APPROVED BY:

*DB*

\*\*\*FOR QUESTIONS CONCERNING THIS ANALYSIS CALL: 406-444-2642

STATE OF MONTANA  
DEPARTMENT OF PUBLIC HEALTH AND HUMAN SERVICES  
COGSWELL BUILDING  
HELENA MONTANA, 59620-0901

LABORATORY SYSTEM

CCOUNT: SHW00002 ATTN: JOHN WADHAMS  
RC NR:

DEQ ENVIORNMENTAL REMEDIATION BUREAU 2  
PO BOX 200901  
HELENA MT 59620-0000

IN DATE: 06/02/97 TIME: 11:51 BY: DRM SAMPLE ID: L-88-10  
LATITUDE: STORET ID:  
LONGITUDE: LEGAL DESCRIPTION:  
  
LEGAL TEXT:  
SITE DESCRIPTION:

IP:	C/F:	FLOW:	UNITS:	METHOD:	CONDUCTIVITY:
	STAFF GUAGE HT:	DISSOLVED O2:	MG/L	TURBIDITY:	NTU
OLD COMMENTS:	WATER USAGE: <----->				

\*\*\*CHEM LAB SAMPLE REPORT\*\*\*

June 24, 1997

b#	collect		collect		collect		reported	units
	testid	date	time	by	method	agency		
706-101779	VOC	05/29/97	1412	JOHN W.			ATTACHED	UG/L

PROVED BY: DB  
FOR QUESTIONS CONCERNING THIS ANALYSIS CALL: 406-444-2642

STATE OF MONTANA  
DEPARTMENT OF PUBLIC HEALTH AND HUMAN SERVICES  
COGSWELL BUILDING  
HELENA MONTANA, 59620-0901

LABORATORY SYSTEM

ACCOUNT: SHW00002 ATTN: JOHN WADHAMS  
RC NR:

DEQ ENVIORNMENTAL REMEDIATION BUREAU 2  
PO BOX 200901  
HELENA MT 59620-0000

LOGIN DATE: 06/02/97 TIME: 11:51 BY: DRM SAMPLE ID: L-88-13  
LATITUDE: STORET ID:  
LONGITUDE: LEGAL DESCRIPTION:

LEGAL TEXT:  
SITE DESCRIPTION:

TEMP:	C/F:	FLOW:	UNITS:	METHOD:	CONDUCTIVITY:	
PH:	STAFF GUAGE HT:		DISSOLVED O2:	MG/L	TURBIDITY:	NTU
FIELD COMMENTS:		WATER USAGE: <----->				

\*\*\*CHEM LAB SAMPLE REPORT\*\*\*

June 24, 1997

lab#	testid	collect date	collect time by	collect method agency	reported	units
C9706-101780	VOC	05/29/97	1523 JOHN W.		ATTACHED	UG/L

APPROVED BY: DB  
\*\*\*FOR QUESTIONS CONCERNING THIS ANALYSIS CALL: 406-444-2642

STATE OF MONTANA  
DEPARTMENT OF PUBLIC HEALTH AND HUMAN SERVICES  
COGSWELL BUILDING  
HELENA MONTANA, 59620-0901

LABORATORY SYSTEM

ACCOUNT: SHW00002 ATTN: JOHN WADHAMS  
RC NR:

DEQ ENVIORNMENTAL REMEDIATION BUREAU 2.  
PO BOX 200901  
HELENA MT 59620-0000

GIN DATE: 06/02/97 TIME: 11:51 BY: DRM SAMPLE ID: L-87-7  
LATITUDE: STORET ID:  
LONGITUDE: LEGAL DESCRIPTION:

LEGAL TEXT:  
SITE DESCRIPTION:

EMP: C/F: FLOW: UNITS: METHOD: CONDUCTIVITY:  
I: STAFF GUAGE HT: DISSOLVED O2: MG/L TURBIDITY: NTU  
FIELD COMMENTS: WATER USAGE: <----->

\*\*\*CHEM LAB SAMPLE REPORT\*\*\*

June 24, 1997

lab#	testid	collect date	collect time by	collect method agency	reported	units
9706-101782	VOC	05/29/97	1542 JOHN W.		ATTACHED	UG/L

APPROVED BY: DB  
\*\*\*FOR QUESTIONS CONCERNING THIS ANALYSIS CALL: 406-444-2642

STATE OF MONTANA  
DEPARTMENT OF PUBLIC HEALTH AND HUMAN SERVICES  
COGSWELL BUILDING  
HELENA MONTANA, 59620-0901

LABORATORY SYSTEM

ACCOUNT: SHW00002 ATTN: JOHN WADHAMS  
RC NR:

DEQ ENVIORNMENTAL REMEDIATION BUREAU 2  
PO BOX 200901  
HELENA MT 59620-0000

LOGIN DATE: 06/02/97 TIME: 11:51 BY: DRM SAMPLE ID: L-87-8  
LATITUDE: STORET ID:  
LONGITUDE: LEGAL DESCRIPTION:

LEGAL TEXT:  
SITE DESCRIPTION:

TEMP: C/F: FLOW: UNITS: METHOD: CONDUCTIVITY:  
PH: STAFF GUAGE HT: DISSOLVED O2: MG/L TURBIDITY: NTU  
FIELD COMMENTS: WATER USAGE: <----->

\*\*\*CHEM LAB SAMPLE REPORT\*\*\*

June 24, 199

lab#	testid	collect date	collect time by	collect method agency	reported	units
C9706-101781	VOC	05/29/97	1650 JOHN W.		ATTACHED	UG/L

APPROVED BY:

*DB*

\*\*FOR QUESTIONS CONCERNING THIS ANALYSIS CALL: 406-444-2642

MONTANA DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES  
CHEMISTRY LABORATORY  
VOLATILE ORGANIC COMPOUNDS

Laboratory Number: C9706-101777

Client Name: JOHN WADHAMS  
Address: DEQ, REMEDIATION  
2209 PHOENIX  
HELENA, MT 59620

Account #: 497751

Sample ID: L-87-3  
Date Sampled: 5/29-97  
Date Received: 6/2/97  
Date Extracted: N/A  
Date Analyzed: 6/4/97

Sample Matrix: AQUEOUS  
Sampled By: JOHN WADHAMS

Extraction Method: N/A  
Analysis Method: EPA 524.2

Comments:

Analyst: Dennis Braun

Date:6/23/97



STATE OF MONTANA  
DEPARTMENT OF PUBLIC HEALTH AND HUMAN SERVICES  
COGSWELL BUILDING  
HELENA MONTANA, 59620-0901

LABORATORY SYSTEM

ACCOUNT: SHW00002 ATTN: JOHN WADHAMS  
RC NR:

DEQ ENVIORNMENTAL REMEDIATION BUREAU 2  
PO BOX 200901  
HELENA MT 59620-0000

LOGIN DATE: 06/02/97 TIME: 11:51 BY: DRM  
LATITUDE:  
LONGITUDE:

SAMPLE ID: L-87-4  
STORET ID:  
LEGAL DESCRIPTION:

LEGAL TEXT:  
SITE DESCRIPTION:

TEMP:	C/F:	FLOW:	UNITS:	METHOD:	CONDUCTIVITY:
PH:	STAFF GUAGE HT:	DISSOLVED O2:	MG/L	TURBIDITY:	NTU
FIELD COMMENTS:		WATER USAGE: <----->			

\*\*\*CHEM LAB SAMPLE REPORT\*\*\*

June 24, 19

lab#	testid	collect date	collect time by	collect method agency	reported	units
C9706-101783	VOC	05/29/97	JOHN W.		ATTACHED	UG/L

APPROVED BY:

*DB*

\*\*\*FOR QUESTIONS CONCERNING THIS ANALYSIS CALL: 406-444-2642

Laboratory Number: C9706-101777-83

Volatile Organic Compounds  
Method Blank Summary

Parameter.....Result

Parameter.....Result

All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromomethane	ND
Chloromethane	ND	Chlorobenzene	ND
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	ND
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	ND
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	ND	Isopropylbenzene	ND
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	ND	1,1,2,2-Tetrachloroethane	ND
Bromochloromethane	ND	N-Propylbenzene	ND
Chloroform	ND	2-Chlorotoluene	ND
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	1,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	ND	1,2,4-Trimethylbenzene	ND
1,2-Dichloroethane	ND	sec-Butylbenzene	ND
Trichloroethene	ND	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	ND
Dibromomethane	ND	4-Isopropyltoluene	ND
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	ND
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	ND
Tetrachloroethene	ND	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

ND-Compounds not detected above the method detection limit of 0.05 ug/L, except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.

Laboratory Number: C9706-101777

VOLATILE ORGANIC COMPOUNDS  
ANALYSIS REPORT

PARAMETER.....RESULT      L-87-3      PARAMETER.....RESULT

All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromoethane	ND
Chloromethane	ND	Chlorobenzene	ND
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	ND
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	ND
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	.6	Isopropylbenzene	ND
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	15.0	1,1,2,2-Tetrachloroethane	ND
Bromochloromethane	ND	N-Propylbenzene	ND
Chloroform	ND	2-Chlorotoluene	ND
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	1,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	ND	1,2,4-Trimethylbenzene	ND
1,2-Dichloroethane	ND	sec-Butylbenzene	ND
Trichloroethene	7.7	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	ND
Dibromomethane	ND	4-Isopropyltoluene	ND
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	ND
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	ND
Tetrachloroethene	60.8	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

J - Meets the identification criteria, below Detection Limit.

B - Compound detected in Method Blank.

D - Analyzed at a secondary dilution factor.

ND-Compounds not detected above the method detection limit of 0.05 ug/L, except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.

Laboratory Number: C9706-101783

# Volatile Organic Compounds Quality Control Summaries

## Surrogate Recoveries

Compound	% Recovery	Acceptable Range
Bromofluorobenzene	102%	80 - 120
1,4-Dichlorobenzene-d4	104%	80 - 120

## Calibration Check

Compound	True Value	Observed Value	Acceptable Range
1,1-Dichloroethene	20 ug/l	22.5	15 - 25
Chloroform	20	21.6	15 - 25
1,2-Dichloropropane	20	20.7	15 - 25
Toluene	20	22.2	15 - 25
Ethylbenzene	20	21.9	15 - 25
Vinyl Chloride	20	21.0	15 - 25

## Matrix Spike

Compound	Sample Value	Spike Added	Value Observed	Percent Recovery	Acceptable Range
1,1-Dichloroethene	ND	40	40.5	101%	49 - 155
Trichloroethene	ND	40	40.7	102%	71 - 157
Benzene	ND	40	40.0	100%	37 - 151
Toluene	ND	40	40.8	102%	47 - 150
Chlorobenzene	ND	40	42.8	107%	37 - 160
(all values in ug/l)					

## Matrix Spike Duplicate

Compound	Value Observed	Relative Percent Difference	Acceptable Range
1,1-Dichloroethene	32.8 ug/l	19%	0 - 20
Trichloroethene	35.0	14%	0 - 20
Benzene	35.4	12%	0 - 20
Toluene	36.2	10%	0 - 20
Chlorobenzene	39.5	1%	0 - 20



Laboratory Number: C9706-101777-83

Volatile Organic Compounds  
Trip Blank Report

Parameter.....	Result	Parameter.....	Result
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All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromomethane	ND
Chloromethane	ND	Chlorobenzene	ND
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	ND
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	ND
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	ND	Isopropylbenzene	ND
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	ND	1,1,2,2-Tetrachloroethane	ND
Bromochloromethane	ND	N-Propylbenzene	ND
Chloroform	ND	2-Chlorotoluene	ND
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	1,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	ND	1,2,4-Trimethylbenzene	ND
1,2-Dichloroethane	ND	sec-Butylbenzene	ND
Trichloroethene	ND	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	ND
Dibromomethane	ND	4-Isopropyltoluene	ND
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	ND
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	ND
Tetrachloroethene	ND	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

ND-Compounds not detected above the method detection limit of 0.05 ug/L, except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.

Laboratory Number: C9706-101778

VOLATILE ORGANIC COMPOUNDS  
ANALYSIS REPORT

PARAMETER.....RESULT

PARAMETER.....RESULT

#3

All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromoethane	ND
Chloromethane	ND	Chlorobenzene	ND
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	ND
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	ND
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	ND	Isopropylbenzene	ND
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	ND	1,1,2,2-Tetrachloroethane	ND
Bromochloromethane	ND	N-Propylbenzene	ND
Chloroform	ND	2-Chlorotoluene	ND
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	1,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	ND	1,2,4-Trimethylbenzene	ND
1,2-Dichloroethane	ND	sec-Butylbenzene	ND
Trichloroethene	ND	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	ND
Dibromomethane	ND	4-Isopropyltoluene	ND
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	ND
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	ND
Tetrachloroethene	ND	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

J - Meets the identification criteria, below Detection Limit.

B - Compound detected in Method Blank.

D - Analyzed at a secondary dilution factor.

ND-Compounds not detected above the method detection limit of 0.05 ug/L, except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.



MONTANA DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES  
CHEMISTRY LABORATORY  
VOLATILE ORGANIC COMPOUNDS

Laboratory Number: C9706-101778

Client Name: JOHN WADHAMS  
Address: DEQ, REMEDIATION  
2209 PHOENIX  
HELENA, MT 59620

Account #: 497751

Sample ID: Well 3  
Date Sampled: 5/29-97  
Date Received: 6/2/97  
Date Extracted: N/A  
Date Analyzed: 6/4/97

Sample Matrix: AQUEOUS  
Sampled By: JOHN WADHAMS

Extraction Method: N/A  
Analysis Method: EPA 524.2

Comments:

Analyst: Dennis Braun

Date:6/23/97

Laboratory Number: C9706-101777-83

Volatile Organic Compounds  
Trip Blank Report

Parameter.....	Result	Parameter.....	Result
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All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromomethane	ND
Chloromethane	ND	Chlorobenzene	ND
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	ND
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	ND
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	ND	Isopropylbenzene	ND
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	ND	1,1,2,2-Tetrachloroethane	ND
Bromochloromethane	ND	N-Propylbenzene	ND
Chloroform	ND	2-Chlorotoluene	ND
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	p,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	ND	1,2,4-Trimethylbenzene	ND
1,2-Dichloroethane	ND	sec-Butylbenzene	ND
Trichloroethene	ND	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	ND
Dibromomethane	ND	4-Isopropyltoluene	ND
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	ND
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	ND
Tetrachloroethene	ND	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

ND-Compounds not detected above the method detection limit of 0.05 ug/L, except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.

Laboratory Number: C9706-101778-83

Volatile Organic Compounds  
Method Blank Summary

Parameter.....	Result	Parameter.....	Result
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All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromomethane	ND
Chloromethane	ND	Chlorobenzene	ND
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	ND
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	ND
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	ND	Isopropylbenzene	ND
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	ND	1,1,2,2-Tetrachloroethane	ND
Bromochloromethane	ND	N-Propylbenzene	ND
Chloroform	ND	2-Chlorotoluene	ND
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	1,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	ND	1,2,4-Trimethylbenzene	ND
1,2-Dichloroethane	ND	sec-Butylbenzene	ND
Trichloroethene	ND	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	ND
Dibromomethane	ND	4-Isopropyltoluene	ND
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	ND
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	ND
Tetrachloroethene	ND	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

ND-Compounds not detected above the method detection limit of 0.05 ug/L except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.

Laboratory Number: C9706-101783

Volatile Organic Compounds  
Quality Control Summaries

## Surrogate Recoveries

Compound	% Recovery	Acceptable Range
Bromofluorobenzene	102%	80 - 120
1,4-Dichlorobenzene-d4	104%	80 - 120

## Calibration Check

Compound	True Value	Observed Value	Acceptable Range
1,1-Dichloroethene	20 ug/l	22.5	15 - 25
Chloroform	20	21.6	15 - 25
1,2-Dichloropropane	20	20.7	15 - 25
Toluene	20	22.2	15 - 25
Ethylbenzene	20	21.9	15 - 25
Vinyl Chloride	20	21.0	15 - 25

## Matrix Spike

Compound	Sample Value	Spike Added	Value Observed	Percent Recovery	Acceptable Range
1,1-Dichloroethene	ND	40	40.5	101%	49 - 155
Trichloroethene	ND	40	40.7	102%	71 - 157
Benzene	ND	40	40.0	100%	37 - 151
Toluene	ND	40	40.8	102%	47 - 150
Chlorobenzene	ND	40	42.8	107%	37 - 160
(all values in ug/l)					

## Matrix Spike Duplicate

Compound	Value Observed	Relative Percent Difference	Acceptable Range
1,1-Dichloroethene	32.8 ug/l	19%	0 - 20
Trichloroethene	35.0	14%	0 - 20
Benzene	35.4	12%	0 - 20
Toluene	36.2	10%	0 - 20
Chlorobenzene	39.5	1%	0 - 20



MONTANA DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES  
CHEMISTRY LABORATORY  
VOLATILE ORGANIC COMPOUNDS

Laboratory Number: C9706-101779

Client Name: JOHN WADHAMS  
Address: DEQ, REMEDIATION  
2209 PHOENIX  
HELENA, MT 59620

Account #: 497751

Sample ID: L-88-10  
Date Sampled: 5/29-97  
Date Received: 6/2/97  
Date Extracted: N/A  
Date Analyzed: 6/4/97

Sample Matrix: AQUEOUS  
Sampled By: JOHN WADHAMS

Extraction Method: N/A  
Analysis Method: EPA 524.2

Comments:

Analyst: Dennis Braun

Date:6/23/97

Laboratory Number: C9706-101779

VOLATILE ORGANIC COMPOUNDS  
ANALYSIS REPORT

PARAMETER.....RESULT

L-88-10

PARAMETER.....RESULT

All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromoethane	ND
Chloromethane	ND	Chlorobenzene	3.5
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	ND
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	ND
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	1.1	Isopropylbenzene	ND
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	11.8	1,1,2,2-Tetrachloroethane	ND
Bromochloromethane	ND	N-Propylbenzene	ND
Chloroform	ND	2-Chlorotoluene	ND
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	1,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	ND	1,2,4-Trimethylbenzene	ND
1,2-Dichloroethane	ND	sec-Butylbenzene	ND
Trichloroethene	7.4	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	.7
Dibromomethane	ND	4-Isopropyltoluene	ND
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	ND
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	ND
Tetrachloroethene	21.8	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

J - Meets the identification criteria, below Detection Limit.

B - Compound detected in Method Blank.

D - Analyzed at a secondary dilution factor.

ND-Compounds not detected above the method detection limit of 0.05 ug/L, except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.



Laboratory Number: C9706-101778-83

Volatile Organic Compounds  
Method Blank Summary

Parameter.....Result Parameter.....Result

All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromomethane	ND
Chloromethane	ND	Chlorobenzene	ND
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	ND
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	ND
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	ND	Isopropylbenzene	ND
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	ND	1,1,2,2-Tetrachloroethane	ND
Bromoform	ND	N-Propylbenzene	ND
Chloroform	ND	2-Chlorotoluene	ND
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	1,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	ND	1,2,4-Trimethylbenzene	ND
1,2-Dichloroethane	ND	sec-Butylbenzene	ND
Trichloroethene	ND	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	ND
Dibromomethane	ND	4-Isopropyltoluene	ND
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	ND
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	ND
Tetrachloroethene	ND	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

ND-Compounds not detected above the method detection limit of 0.05 ug/L,  
except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.

Laboratory Number: C9706-101777-83

Volatile Organic Compounds  
Trip Blank Report

Parameter.....Result

Parameter.....Result

All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromomethane	ND
Chloromethane	ND	Chlorobenzene	ND
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	ND
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	ND
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	ND	Isopropylbenzene	ND
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	ND	1,1,2,2-Tetrachloroethane	ND
Bromochloromethane	ND	N-Propylbenzene	ND
Chloroform	ND	2-Chlorotoluene	ND
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	1,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	ND	1,2,4-Trimethylbenzene	ND
1,2-Dichloroethane	ND	sec-Butylbenzene	ND
Trichloroethene	ND	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	ND
Dibromomethane	ND	4-Isopropyltoluene	ND
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	ND
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	ND
Tetrachloroethene	ND	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

ND-Compounds not detected above the method detection limit of 0.05 ug/L, except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.

Laboratory Number: C9706-101783

### Volatile Organic Compounds Quality Control Summaries

**Surrogate Recoveries**

Compound	% Recovery	Acceptable Range
Bromofluorobenzene	102%	80 - 120
1,4-Dichlorobenzene-d4	104%	80 - 120

**Calibration Check**

Compound	True Value	Observed Value	Acceptable Range
1,1-Dichloroethene	20 ug/l	22.5	15 - 25
Chloroform	20	21.6	15 - 25
1,2-Dichloropropane	20	20.7	15 - 25
Toluene	20	22.2	15 - 25
Ethylbenzene	20	21.9	15 - 25
Vinyl Chloride	20	21.0	15 - 25

**Matrix Spike**

Compound	Sample Value	Spike Added	Value Observed	Percent Recovery	Acceptable Range
1,1-Dichloroethene	ND	40	40.5	101%	49 - 155
Trichloroethene	ND	40	40.7	102%	71 - 157
Benzene	ND	40	40.0	100%	37 - 151
Toluene	ND	40	40.8	102%	47 - 150
Chlorobenzene	ND	40	42.8	107%	37 - 160

(all values in ug/l)

**Matrix Spike Duplicate**

Compound	Value Observed	Relative Percent Difference	Acceptable Range
1,1-Dichloroethene	32.8 ug/l	19%	0 - 20
Trichloroethene	35.0	14%	0 - 20
Benzene	35.4	12%	0 - 20
Toluene	36.2	10%	0 - 20
Chlorobenzene	39.5	1%	0 - 20

MONTANA DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES  
CHEMISTRY LABORATORY  
VOLATILE ORGANIC COMPOUNDS

Laboratory Number: C9706-101780

Client Name: JOHN WADHAMS  
Address: DEQ, REMEDIATION  
2209 PHOENIX  
HELENA, MT 59620

Account #: 497751

Sample ID: L-88-13  
Date Sampled: 5/29-97  
Date Received: 6/2/97  
Date Extracted: N/A  
Date Analyzed: 6/4/97

Sample Matrix: AQUEOUS  
Sampled By: JOHN WADHAMS

Extraction Method: N/A  
Analysis Method: EPA 524.2

Comments:

Analyst: Dennis Braun

Date:6/23/97



Laboratory Number: C9706-101780

VOLATILE ORGANIC COMPOUNDS  
ANALYSIS REPORT

PARAMETER..... RESULT      L-88-13      PARAMETER..... RESULT

All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromoethane	ND
Chloromethane	ND	Chlorobenzene	ND
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	ND
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	ND
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	ND	Isopropylbenzene	ND
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	1.6	1,1,2,2-Tetrachloroethane	ND
Bromochloromethane	ND	N-Propylbenzene	ND
Chloroform	ND	2-Chlorotoluene	ND
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	1,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	ND	1,2,4-Trimethylbenzene	ND
1,2-Dichloroethane	ND	sec-Butylbenzene	ND
Trichloroethene	2.8	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	ND
Dibromomethane	ND	4-Isopropyltoluene	ND
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	ND
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	ND
Tetrachloroethene	17.1	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

J - Meets the identification criteria, below Detection Limit.

B - Compound detected in Method Blank.

D - Analyzed at a secondary dilution factor.

ND-Compounds not detected above the method detection limit of 0.05 ug/L,  
except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.



Laboratory Number: C9706-101778-83

Volatile Organic Compounds  
 Method Blank Summary

Parameter.....	Result	Parameter.....	Result
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All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromomethane	ND
Chloromethane	ND	Chlorobenzene	ND
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	ND
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	ND
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	ND	Isopropylbenzene	ND
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	ND	1,1,2,2-Tetrachloroethane	ND
Bromochoromethane	ND	N-Propylbenzene	ND
Chloroform	ND	2-Chlorotoluene	ND
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	1,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	ND	1,2,4-Trimethylbenzene	ND
1,2-Dichloroethane	ND	sec-Butylbenzene	ND
Trichloroethene	ND	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	ND
Dibromomethane	ND	4-Isopropyltoluene	ND
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	ND
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	ND
Tetrachloroethene	ND	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

ND-Compounds not detected above the method detection limit of 0.05 ug/L, except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.

Laboratory Number: C9706-101777-83

Volatile Organic Compounds  
Trip Blank Report

Parameter.....	Result	Parameter.....	Result
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All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromomethane	ND
Chloromethane	ND	Chlorobenzene	ND
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	ND
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	ND
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	ND	Isopropylbenzene	ND
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	ND	1,1,2,2-Tetrachloroethane	ND
Bromochloromethane	ND	N-Propylbenzene	ND
Chloroform	ND	2-Chlorotoluene	ND
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	1,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	ND	1,2,4-Trimethylbenzene	ND
1,2-Dichloroethane	ND	sec-Butylbenzene	ND
Trichloroethene	ND	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	ND
Dibromomethane	ND	4-Isopropyltoluene	ND
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	ND
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	ND
Tetrachloroethene	ND	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

ND-Compounds not detected above the method detection limit of 0.05 ug/L, except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.

Laboratory Number: C9706-101783

# Volatile Organic Compounds Quality Control Summaries

## Surrogate Recoveries

Compound	% Recovery	Acceptable Range
Bromofluorobenzene	102%	80 - 120
1,4-Dichlorobenzene-d4	104%	80 - 120

## Calibration Check

Compound	True Value	Observed Value	Acceptable Range
1,1-Dichloroethene	20 ug/l	22.5	15 - 25
Chloroform	20	21.6	15 - 25
1,2-Dichloropropane	20	20.7	15 - 25
Toluene	20	22.2	15 - 25
Ethylbenzene	20	21.9	15 - 25
Vinyl Chloride	20	21.0	15 - 25

## Matrix Spike

Compound	Sample Value	Spike Added	Value Observed	Percent Recovery	Acceptable Range
1,1-Dichloroethene	ND	40	40.5	101%	49 - 155
Trichloroethene	ND	40	40.7	102%	71 - 157
Benzene	ND	40	40.0	100%	37 - 151
Toluene	ND	40	40.8	102%	47 - 150
Chlorobenzene	ND	40	42.8	107%	37 - 160
(all values in ug/l)					

## Matrix Spike Duplicate

Compound	Value Observed	Relative Percent Difference	Acceptable Range
1,1-Dichloroethene	32.8 ug/l	19%	0 - 20
Trichloroethene	35.0	14%	0 - 20
Benzene	35.4	12%	0 - 20
Toluene	36.2	10%	0 - 20
Chlorobenzene	39.5	1%	0 - 20

MONTANA DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES  
CHEMISTRY LABORATORY  
VOLATILE ORGANIC COMPOUNDS

Laboratory Number: C9706-101781

Client Name: JOHN WADHAMS  
Address: DEQ, REMEDIATION  
2209 PHOENIX  
HELENA, MT 59620

Account #: 497751

Sample ID: L-87-8  
Date Sampled: 5/29-97  
Date Received: 6/2/97  
Date Extracted: N/A  
Date Analyzed: 6/9/97

Sample Matrix: AQUEOUS  
Sampled By: JOHN WADHAMS

Extraction Method: N/A  
Analysis Method: EPA 524.2

Comments:

Analyst: Dennis Braun

Date:6/23/97



Laboratory Number: C9706-101781

VOLATILE ORGANIC COMPOUNDS  
ANALYSIS REPORT

PARAMETER.....RESULT      L-87-8      PARAMETER.....RESULT

All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromoethane	ND
Chloromethane	ND	Chlorobenzene	ND
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	ND
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	ND
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	ND	Isopropylbenzene	ND
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	.7	1,1,2,2-Tetrachloroethane	ND
Bromochloromethane	ND	N-Propylbenzene	ND
Chloroform	ND	2-Chlorotoluene	ND
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	1,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	ND	1,2,4-Trimethylbenzene	ND
1,2-Dichloroethane	ND	sec-Butylbenzene	ND
Trichloroethene	1.0	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	ND
Dibromomethane	ND	4-Isopropyltoluene	1.0
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	ND
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	1.4
Tetrachloroethene	3.1	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

J - Meets the identification criteria, below Detection Limit.

B - Compound detected in Method Blank.

D - Analyzed at a secondary dilution factor.

ND-Compounds not detected above the method detection limit of 0.05 ug/L, except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.



Laboratory Number: C9706-101778-83

## Volatile Organic Compounds

## Method Blank Summary

Parameter.....	Result	Parameter.....	Result
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All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromomethane	ND
Chloromethane	ND	Chlorobenzene	ND
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	ND
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	ND
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	ND	Isopropylbenzene	ND
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	ND	1,1,2,2-Tetrachloroethane	ND
Bromochloromethane	ND	N-Propylbenzene	ND
Chloroform	ND	2-Chlorotoluene	ND
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	1,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	ND	1,2,4-Trimethylbenzene	ND
1,2-Dichloroethane	ND	sec-Butylbenzene	ND
Trichloroethene	ND	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	ND
Dibromomethane	ND	4-Isopropyltoluene	ND
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	ND
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	ND
Tetrachloroethene	ND	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

ND-Compounds not detected above the method detection limit of 0.05 ug/L, except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.

Laboratory Number: C9706-101777-83

Volatile Organic Compounds  
Trip Blank Report

Parameter.....Result

Parameter.....Result

All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromomethane	ND
Chloromethane	ND	Chlorobenzene	ND
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	ND
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	ND
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	ND	Isopropylbenzene	ND
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	ND	1,1,2,2-Tetrachloroethane	ND
Bromochloromethane	ND	N-Propylbenzene	ND
Chloroform	ND	2-Chlorotoluene	ND
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	1,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	ND	1,2,4-Trimethylbenzene	ND
1,2-Dichloroethane	ND	sec-Butylbenzene	ND
Trichloroethene	ND	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	ND
Dibromomethane	ND	4-Isopropyltoluene	ND
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	ND
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	ND
Tetrachloroethene	ND	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

ND-Compounds not detected above the method detection limit of 0.05 ug/L,  
except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.

Laboratory Number: C9706-101783

**Volatile Organic Compounds  
Quality Control Summaries**

**Surrogate Recoveries**

Compound	% Recovery	Acceptable Range
Bromofluorobenzene	102%	80 - 120
1,4-Dichlorobenzene-d4	104%	80 - 120

**Calibration Check**

Compound	True Value	Observed Value	Acceptable Range
1,1-Dichloroethene	20 ug/l	22.5	15 - 25
Chloroform	20	21.6	15 - 25
1,2-Dichloropropane	20	20.7	15 - 25
Toluene	20	22.2	15 - 25
Ethylbenzene	20	21.9	15 - 25
Vinyl Chloride	20	21.0	15 - 25

**Matrix Spike**

Compound	Sample Value	Spike Added	Value Observed	Percent Recovery	Acceptable Range
1,1-Dichloroethene	ND	40	40.5	101%	49 - 155
Trichloroethene	ND	40	40.7	102%	71 - 157
Benzene	ND	40	40.0	100%	37 - 151
Toluene	ND	40	40.8	102%	47 - 150
Chlorobenzene	ND	40	42.8	107%	37 - 160

(all values in ug/l)

**Matrix Spike Duplicate**

Compound	Value Observed	Relative Percent Difference	Acceptable Range
1,1-Dichloroethene	32.8 ug/l	19%	0 - 20
Trichloroethene	35.0	14%	0 - 20
Benzene	35.4	12%	0 - 20
Toluene	36.2	10%	0 - 20
Chlorobenzene	39.5	1%	0 - 20

MONTANA DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES  
CHEMISTRY LABORATORY  
VOLATILE ORGANIC COMPOUNDS

Laboratory Number: C9706-101782

Client Name: JOHN WADHAMS  
Address: DEQ, REMEDIATION  
2209 PHOENIX  
HELENA, MT 59620

Account #: 497751

Sample ID: L-87-7  
Date Sampled: 5/29-97  
Date Received: 6/2/97  
Date Extracted: N/A  
Date Analyzed: 6/9/97

Sample Matrix: AQUEOUS  
Sampled By: JOHN WADHAMS

Extraction Method: N/A  
Analysis Method: EPA 524.2

Comments:

Analyst: Dennis Braun

Date:6/23/97



Laboratory Number: C9706-101782

# VOLATILE ORGANIC COMPOUNDS ANALYSIS REPORT

PARAMETER.....	RESULT	PARAMETER.....	RESULT
	L-87-7		

All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromoethane	ND
Chloromethane	ND	Chlorobenzene	ND
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	4.4
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	2.7
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	ND	Isopropylbenzene	6.3
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	ND	1,1,2,2-Tetrachloroethane	ND
Bromo chloromethane	ND	N-Propylbenzene	4.2
Chloroform	ND	2-Chlorotoluene	1.6
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	1,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	.6	1,2,4-Trimethylbenzene	ND
1,2-Dichloroethane	ND	sec-Butylbenzene	5.0
Trichloroethene	ND	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	ND
Dibromomethane	ND	4-Isopropyltoluene	ND
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	5.8
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	26.0
Tetrachloroethene	ND	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

J - Meets the identification criteria, below Detection Limit.

B - Compound detected in Method Blank.

D - Analyzed at a secondary dilution factor.

ND-Compounds not detected above the method detection limit of 0.05 ug/L, except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.



Laboratory Number: C9706-101778-83

Volatile Organic Compounds  
Method Blank Summary

Parameter.....Result Parameter.....Result

All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromomethane	ND
Chloromethane	ND	Chlorobenzene	ND
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	ND
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	ND
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	ND	Isopropylbenzene	ND
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	ND	1,1,2,2-Tetrachloroethane	ND
Bromochloromethane	ND	N-Propylbenzene	ND
Chloroform	ND	2-Chlorotoluene	ND
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	1,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	ND	1,2,4-Trimethylbenzene	ND
1,2-Dichloroethane	ND	sec-Butylbenzene	ND
Trichloroethene	ND	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	ND
Dibromomethane	ND	4-Isopropyltoluene	ND
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	ND
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	ND
Tetrachloroethene	ND	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

ND-Compounds not detected above the method detection limit of 0.05 ug/L, except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.

Laboratory Number: C9706-101777-83

Volatile Organic Compounds  
Trip Blank Report

Parameter.....	Result	Parameter.....	Result
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All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromomethane	ND
Chloromethane	ND	Chlorobenzene	ND
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	ND
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	ND
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	ND	Isopropylbenzene	ND
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	ND	1,1,2,2-Tetrachloroethane	ND
Bromochloromethane	ND	N-Propylbenzene	ND
Chloroform	ND	2-Chlorotoluene	ND
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	1,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	ND	1,2,4-Trimethylbenzene	ND
1,2-Dichloroethane	ND	sec-Butylbenzene	ND
Trichloroethene	ND	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	ND
Dibromomethane	ND	4-Isopropyltoluene	ND
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	ND
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	ND
Tetrachloroethene	ND	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

ND-Compounds not detected above the method detection limit of 0.05 ug/L, except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.

Laboratory Number: C9706-101783

Volatile Organic Compounds  
Quality Control Summaries

## Surrogate Recoveries

Compound	% Recovery	Acceptable Range
Bromofluorobenzene	102%	80 - 120
1,4-Dichlorobenzene-d4	104%	80 - 120

## Calibration Check

Compound	True Value	Observed Value	Acceptable Range
1,1-Dichloroethene	20 ug/l	22.5	15 - 25
Chloroform	20	21.6	15 - 25
1,2-Dichloropropane	20	20.7	15 - 25
Toluene	20	22.2	15 - 25
Ethylbenzene	20	21.9	15 - 25
Vinyl Chloride	20	21.0	15 - 25

## Matrix Spike

Compound	Sample Value	Spike Added	Value Observed	Percent Recovery	Acceptable Range
1,1-Dichloroethene	ND	40	40.5	101%	49 - 155
Trichloroethene	ND	40	40.7	102%	71 - 157
Benzene	ND	40	40.0	100%	37 - 151
Toluene	ND	40	40.8	102%	47 - 150
Chlorobenzene	ND	40	42.8	107%	37 - 160
(all values in ug/l)					

## Matrix Spike Duplicate

Compound	Value Observed	Relative Percent Difference	Acceptable Range
1,1-Dichloroethene	32.8 ug/l	19%	0 - 20
Trichloroethene	35.0	14%	0 - 20
Benzene	35.4	12%	0 - 20
Toluene	36.2	10%	0 - 20
Chlorobenzene	39.5	1%	0 - 20

MONTANA DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES  
CHEMISTRY LABORATORY  
VOLATILE ORGANIC COMPOUNDS

Laboratory Number: C9706-101783

Client Name: JOHN WADHAMS  
Address: DEQ, REMEDIATION  
2209 PHOENIX  
HELENA, MT 59620

Account #: 497751

Sample ID: L-87-4  
Date Sampled: 5/29-97  
Date Received: 6/2/97  
Date Extracted: N/A  
Date Analyzed: 6/9/97

Sample Matrix: AQUEOUS  
Sampled By: JOHN WADHAMS

Extraction Method: N/A  
Analysis Method: EPA 524.2

Comments:

Analyst: Dennis Braun

Date:6/23/97



Laboratory Number: C9706-101783

VOLATILE ORGANIC COMPOUNDS  
ANALYSIS REPORT

PARAMETER.....RESULT

PARAMETER.....RESULT

L-87-4

All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromoethane	ND
Chloromethane	ND	Chlorobenzene	ND
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	ND
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	ND
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	ND	Isopropylbenzene	ND
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	ND	1,1,2,2-Tetrachloroethane	ND
Bromochloromethane	ND	N-Propylbenzene	ND
Chloroform	ND	2-Chlorotoluene	ND
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	1,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	ND	1,2,4-Trimethylbenzene	.6
1,2-Dichloroethane	ND	sec-Butylbenzene	ND
Trichloroethene	ND	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	ND
Dibromomethane	ND	4-Isopropyltoluene	ND
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	ND
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	.6
Tetrachloroethene	ND	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

1 - Meets the identification criteria, below Detection Limit.

3 - Compound detected in Method Blank.

D - Analyzed at a secondary dilution factor.

ND-Compounds not detected above the method detection limit of 0.05 ug/L,  
except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.



Laboratory Number: C9706-101778-83

## Volatile Organic Compounds

## Method Blank Summary

Parameter.....Result

Parameter.....Result

All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromomethane	ND
Chloromethane	ND	Chlorobenzene	ND
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	ND
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	ND
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	ND	Isopropylbenzene	ND
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	ND	1,1,2,2-Tetrachloroethane	ND
Bromochloromethane	ND	N-Propylbenzene	ND
Chloroform	ND	2-Chlorotoluene	ND
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	1,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	ND	1,2,4-Trimethylbenzene	ND
1,2-Dichloroethane	ND	sec-Butylbenzene	ND
Trichloroethene	ND	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	ND
Dibromomethane	ND	4-Isopropyltoluene	ND
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	ND
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	ND
Tetrachloroethene	ND	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

ND-Compounds not detected above the method detection limit of 0.05 ug/L,  
except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.

Laboratory Number: C9706-101777-83

Volatile Organic Compounds  
Trip Blank Report

Parameter.....Result

Parameter.....Result

All results expressed in ug/L

Dichlorodifluoromethane	ND	1,2-Dibromomethane	ND
Chloromethane	ND	Chlorobenzene	ND
Vinyl Chloride	ND	1,1,1,2-Tetrachloroethane	ND
Bromomethane	ND	Ethylbenzene	ND
Chloroethane	ND	meta plus para Xylene	ND
Trichlorofluoromethane	ND	ortho Xylene	ND
1,1-Dichloroethene	ND	Styrene	ND
Methylene Chloride	ND	Bromoform	ND
trans 1,2-Dichloroethene	ND	Isopropylbenzene	ND
1,1-Dichloroethane	ND	Bromobenzene	ND
2,2-Dichloropropane	ND	1,2,3-Trichloropropane	ND
cis 1,2-Dichloroethene	ND	1,1,2,2-Tetrachloroethane	ND
Bromochloromethane	ND	N-Propylbenzene	ND
Chloroform	ND	2-Chlorotoluene	ND
1,1,1-Trichloroethane	ND	4-Chlorotoluene	ND
Carbon Tetrachloride	ND	1,3,5-Trimethylbenzene	ND
1,1-Dichloropropene	ND	tert-Butylbenzene	ND
Benzene	ND	1,2,4-Trimethylbenzene	ND
1,2-Dichloroethane	ND	sec-Butylbenzene	ND
Trichloroethene	ND	1,3-Dichlorobenzene	ND
1,2-Dichloropropane	ND	1,4-Dichlorobenzene	ND
Dibromomethane	ND	4-Isopropyltoluene	ND
Bromodichloromethane	ND	1,2-Dichlorobenzene	ND
cis 1,3-Dichloropropene	ND	N-Butylbenzene	ND
Toluene	ND	1,2-Dibromo-3-Chloropropane	ND
trans 1,3-Dichloropropene	ND	1,2,4-Trichlorobenzene	ND
1,1,2-Trichloroethane	ND	Naphthalene	ND
Tetrachloroethene	ND	Hexachlorobutadiene	ND
1,3-Dichloropropane	ND	1,2,3-Trichlorobenzene	ND
Dibromochloromethane	ND		

ND-Compounds not detected above the method detection limit of 0.05 ug/L, except 1,2-Dibromo-3-Chloropropane method detection limit of 1.0 ug/L.

Laboratory Number: C9706-101783

### Volatile Organic Compounds Quality Control Summaries

**Surrogate Recoveries**

Compound	% Recovery	Acceptable Range
Bromofluorobenzene	102%	80 - 120
1,4-Dichlorobenzene-d4	104%	80 - 120

**Calibration Check**

Compound	True Value	Observed Value	Acceptable Range
1,1-Dichloroethene	20 ug/l	22.5	15 - 25
Chloroform	20	21.6	15 - 25
1,2-Dichloropropane	20	20.7	15 - 25
Toluene	20	22.2	15 - 25
Ethylbenzene	20	21.9	15 - 25
Vinyl Chloride	20	21.0	15 - 25

**Matrix Spike**

Compound	Sample Value	Spike Added	Value Observed	Percent Recovery	Acceptable Range
1,1-Dichloroethene	ND	40	40.5	101%	49 - 155
Trichloroethene	ND	40	40.7	102%	71 - 157
Benzene	ND	40	40.0	100%	37 - 151
Toluene	ND	40	40.8	102%	47 - 150
Chlorobenzene	ND	40	42.8	107%	37 - 160
(all values in ug/l)					

**Matrix Spike Duplicate**

Compound	Value Observed	Relative Percent Difference	Acceptable Range
1,1-Dichloroethene	32.8 ug/l	19%	0 - 20
Trichloroethene	35.0	14%	0 - 20
Benzene	35.4	12%	0 - 20
Toluene	36.2	10%	0 - 20
Chlorobenzene	39.5	1%	0 - 20



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FAX (406) 252-6069 • 1-800-735-4489

Client: MT Dept of Environmental Quality  
Date Sampled: 29-MAY-97 09:30  
Date Received: 30-MAY-97  
Extraction Date: 02-JUN-1997  
Analysis Date: 13-JUN-1997 16:50  
Project Info: Burlington Northern Livingston  
Sample Info: L-87-3

Lab No.: 97-33022  
Report Date: 06/16/97 07:21  
Sample Matrix: WATER  
Extraction Method: EPA 3510  
Prep Info: 1000ml to 1ml

**EPA METHOD 8270B: SEMI-VOLATILE ORGANICS ANALYSIS REPORT**

CONCENTRATION UNITS - ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
Acenaphthene	83-32-9	<10	U
Acenaphthylene	208-96-8	<10	U
Anthracene	120-12-7	<10	U
Azobenzene	103-33-3	<10	U
Benzidine	92-87-5	<20	U
Benzo(a)Anthracene	56-55-3	<10	U
Benzo(b)fluoranthene	205-99-2	<10	U
Benzo(k)fluoranthene	207-08-9	<10	U
Benzo(g,h,i)perylene	191-24-2	<10	U
Benzo(a)pyrene	50-32-8	<10	U
4-Bromophenyl-phenylether	101-55-3	<10	U
Butylbenzylphthalate	85-68-7	<10	U
bis(-2-Chloroethoxy)Methane	111-91-1	<10	U
bis(-2-Chloroethyl)Ether	111-44-4	<10	U
bis(2-Chloroisopropyl)ether	108-60-1	<10	U
2-Chloronaphthalene	91-58-7	<10	U
4-Chlorophenyl-phenylether	7005-72-3	<10	U
Chrysene	218-01-9	<10	U
Dibenzo(a,h)anthracene	53-70-3	<10	U
1,2-Dichlorobenzene	95-50-1	<10	U
1,3-Dichlorobenzene	541-73-1	<10	U
1,4-Dichlorobenzene	106-46-7	<10	U
3,3'-Dichlorobenzidine	91-94-1	<20	U
Dimethyl Phthalate	131-11-3	<10	U
Diethylphthalate	84-66-2	<10	U
Di-n-Butylphthalate	84-74-2	<10	U
2,4-Dinitrotoluene	121-14-2	<10	U
2,6-Dinitrotoluene	606-20-2	<10	U
Di-n-octyl Phthalate	117-84-0	<10	U
bis(2-ethylhexyl)Phthalate	117-81-7	<10	U
Fluoranthene	206-44-0	<10	U
Fluorene	86-73-7	<10	U
Hexachlorobenzene	118-74-1	<10	U
Hexachlorobutadiene	87-68-3	<10	U
Hexachlorocyclopentadiene	77-47-4	<10	U
Hexachloroethane	67-72-1	<10	U
Indeno(1,2,3-c,d)pyrene	193-39-5	<10	U
Isophorone	78-59-1	<10	U
1-Methylnaphthalene	90-12-0	<10	U
2-Methylnaphthalene	91-57-6	<10	U
Naphthalene	91-20-3	<10	U
Nitrobenzene	98-95-3	<10	U
N-Nitrosodimethylamine	62-75-9	<10	U
N-nitroso-Di-n-propylamine	621-64-7	<10	U
N-nitrosodiphenylamine	86-30-6	<10	U
Phenanthrene	85-01-8	<10	U
Pyrene	129-00-0	<10	U
Pyridine	110-86-1	<20	U
1,2,4-Trichlorobenzene	120-82-1	<10	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added-ug/L	Measured-ug/L	%Rec	QC Limits
Nitrobenzene-d5	100	65.1	65	35--114
2-Fluorobiphenyl	100	66.3	66	43--116
Terphenyl-d14	100	82.7	83	33--141

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: SW Reviewing Supervisor: WM

/disk3/SV5972.i/sb061397.b/13jun0901009.d

**ENERGY LABORATORIES, INC.**P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325  
FAX (406) 252-6069 • 1-800-735-4489

Client: MT Dept of Environmental Quality  
Date Sampled: 29-MAY-97 12:05  
Date Received: 30-MAY-97  
Extraction Date: 02-JUN-1997  
Analysis Date: 13-JUN-97 17:32  
Project Info: Burlington Northern Livingston  
Sample Info: Well 3

Lab No.: 97-33023  
Report Date: 06/16/97 07:21  
Sample Matrix: WATER  
Extraction Method: EPA 3510  
Prep Info: 1000ml to 1ml

**EPA METHOD 8270B: SEMI-VOLATILE ORGANICS ANALYSIS REPORT**

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
Acenaphthene	83-32-9	<10	U
Acenaphthylene	208-96-8	<10	U
Anthracene	120-12-7	<10	U
Azobenzene	103-33-3	<10	U
Benzidine	92-87-5	<20	U
Benzo(a)Anthracene	56-55-3	<10	U
Benzo(b)fluoranthene	205-99-2	<10	U
Benzo(k)fluoranthene	207-08-9	<10	U
Benzo(g,h,i)perylene	191-24-2	<10	U
Benzo(a)pyrene	50-32-8	<10	U
4-Bromophenyl-phenylether	101-55-3	<10	U
Butylbenzylphthalate	85-68-7	<10	U
bis(-2-Chloroethoxy)Methane	111-91-1	<10	U
bis(-2-Chloroethyl)Ether	111-44-4	<10	U
bis(2-Chloroisopropyl) ether	108-60-1	<10	U
2-Chloronaphthalene	91-58-7	<10	U
4-Chlorophenyl-phenylether	7005-72-3	<10	U
Chrysene	218-01-9	<10	U
Dibenzo(a,h)anthracene	53-70-3	<10	U
1,2-Dichlorobenzene	95-50-1	<10	U
1,3-Dichlorobenzene	541-73-1	<10	U
1,4-Dichlorobenzene	106-46-7	<10	U
3,3'-Dichlorobenzidine	91-94-1	<20	U
Dimethyl Phthalate	131-11-3	<10	U
Diethylphthalate	84-66-2	<10	U
Di-n-Butylphthalate	84-74-2	<10	U
2,4-Dinitrotoluene	121-14-2	<10	U
2,6-Dinitrotoluene	606-20-2	<10	U
Di-n-octyl Phthalate	117-84-0	<10	U
bis(2-ethylhexyl)Phthalate	117-81-7	<10	U
Fluoranthene	206-44-0	<10	U
Fluorene	86-73-7	<10	U
Hexachlorobenzene	118-74-1	<10	U
Hexachlorobutadiene	87-68-3	<10	U
Hexachlorocyclopentadiene	77-47-4	<10	U
Hexachloroethane	67-72-1	<10	U
Indeno(1,2,3-c,d)pyrene	193-39-5	<10	U
Isophorone	78-59-1	<10	U
1-Methylnaphthalene	90-12-0	<10	U
2-Methylnaphthalene	91-57-6	<10	U
Naphthalene	91-20-3	<10	U
Nitrobenzene	98-95-3	<10	U
N-Nitrosodimethylamine	62-75-9	<10	U
N-nitroso-Di-n-propylamine	621-64-7	<10	U
N-nitrosodiphenylamine	86-30-6	<10	U
Phenanthrene	85-01-8	<10	U
Pyrene	129-00-0	<10	U
Pyridine	110-86-1	<20	U
1,2,4-Trichlorobenzene	120-82-1	<10	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added-ug/L	Measured-ug/L	%Rec	QC Limits
Nitrobenzene-d5	100	79.0	79	35--114
2-Fluorobiphenyl	100	78.3	78	43--116
Terphenyl-d14	100	88.1	88	33--141

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: AMReviewing Supervisor: AM

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FAX (406) 252-6069 • 1-800-735-4489

Client: MT Dept of Environmental Quality  
Date Sampled: 29-MAY-97 14:14  
Date Received: 30-MAY-97  
Extraction Date: 02-JUN-1997  
Analysis Date: 13-JUN-97 18:14  
Project Info: Burlington Northern Livingston  
Sample Info: L-88-10

Lab No.: 97-33024  
Report Date: 06/16/97 07:21  
Sample Matrix: WATER  
Extraction Method: EPA 3510  
Prep Info: 1000ml to 1ml

**EPA METHOD 8270B: SEMI-VOLATILE ORGANICS ANALYSIS REPORT**

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
Acenaphthene	83-32-9	<10	U
Acenaphthylene	208-96-8	<10	U
Anthracene	120-12-7	<10	U
Azobenzene	103-33-3	<10	U
Benidine	92-87-5	<20	U
Benzo (a) Anthracene	56-55-3	<10	U
Benzo (b) fluoranthene	205-99-2	<10	U
Benzo (k) fluoranthene	207-08-9	<10	U
Benzo (g, h, i) perylene	191-24-2	<10	U
Benzo (a) pyrene	50-32-8	<10	U
4-Bromophenyl-phenylether	101-55-3	<10	U
Butylbenzylphthalate	85-68-7	<10	U
bis (-2-Chloroethoxy) Methane	111-91-1	<10	U
bis (-2-Chloroethyl) Ether	111-44-4	<10	U
bis (2-Chloroisopropyl) ether	108 <sup>1</sup> -60-1	<10	U
2-Chloronaphthalene	91-58-7	<10	U
4-Chlorophenyl-phenylether	7005-72-3	<10	U
Chrysene	218-01-9	<10	U
Dibenzo (a, h) anthracene	53-70-3	<10	U
1,2-Dichlorobenzene	95-50-1	<10	U
1,3-Dichlorobenzene	541-73-1	<10	U
1,4-Dichlorobenzene	106-46-7	<10	U
3,3'-Dichlorobenzidine	91-94-1	<20	U
Dimethyl Phthalate	131-11-3	<10	U
Diethylphthalate	84-66-2	<10	U
Di-n-Butylphthalate	84-74-2	<10	U
2,4-Dinitrotoluene	121-14-2	<10	U
2,6-Dinitrotoluene	606-20-2	<10	U
Di-n-octyl Phthalate	117-84-0	<10	U
bis (2-ethylhexyl) Phthalate	117-81-7	<10	U
Fluoranthene	206-44-0	<10	U
Fluorene	86-73-7	<10	U
Hexachlorobenzene	118-74-1	<10	U
Hexachlorobutadiene	87-68-3	<10	U
Hexachlorocyclopentadiene	77-47-4	<10	U
Hexachloroethane	67-72-1	<10	U
Indeno (1,2,3-c, d) pyrene	193-39-5	<10	U
Isophorone	78-59-1	<10	U
1-Methylnaphthalene	90-12-0	<10	U
2-Methylnaphthalene	91-57-6	<10	U
Naphthalene	91-20-3	<10	U
Nitrobenzene	98-95-3	<10	U
N-Nitrosodimethylamine	62-75-9	<10	U
N-nitroso-Di-n-propylamine	621-64-7	<10	U
N-nitrosodiphenylamine	86-30-6	<10	U
Phenanthrene	85-01-8	<10	U
Pyrene	129-00-0	<10	U
Pyridine	110-86-1	<20	U
1,2,4-Trichlorobenzene	120-82-1	<10	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added-ug/L	Measured-ug/L	%Rec	QC Limits
Nitrobenzene-d5	100	68.9	69	35--114
2-Fluorobiphenyl	100	70.6	71	43--116
Terphenyl-d14	100	84.3	84	33--141

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: AM Reviewing Supervisor: mm

/disk3/SV5972.i/eb061397.b/13jun1101011.d

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FAX (406) 252-6069 • 1-800-735-4489Client: MT Dept of Environmental Quality  
Date Sampled: 29-MAY-97 15:23  
Date Received: 30-MAY-97  
Extraction Date: 02-JUN-1997  
Analysis Date: 13-JUN-97 18:55  
Project Info: Burlington Northern Livingston  
Sample Info: L-88-13Lab No.: 97-33025  
Report Date: 06/16/97 07:21  
Sample Matrix: WATER  
Extraction Method: EPA 3510  
Prep Info: 1000ml to 1ml**EPA METHOD 8270B: SEMI-VOLATILE ORGANICS ANALYSIS REPORT**

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
Acenaphthene	83-32-9	<10	U
Acenaphthylene	208-96-8	<10	U
Anthracene	120-12-7	<10	U
Azobenzene	103-33-3	<10	U
Benzidine	92-87-5	<20	U
Benzo(a)Anthracene	56-55-3	<10	U
Benzo(b)fluoranthene	205-99-2	<10	U
Benzo(k)fluoranthene	207-08-9	<10	U
Benzo(g,h,i)perylene	191-24-2	<10	U
Benzo(a)pyrene	50-32-8	<10	U
4-Bromophenyl-phenylether	101-55-3	<10	U
Butylbenzylphthalate	85-68-7	<10	U
bis(-2-Chloroethoxy)Methane	111-91-1	<10	U
bis(-2-Chloroethyl)Ether	111-44-4	<10	U
bis(2-Chloroisopropyl)ether	108-60-1	<10	U
2-Chloronaphthalene	91-58-7	<10	U
4-Chlorophenyl-phenylether	7005-72-3	<10	U
Chrysene	218-01-9	<10	U
Dibenzo(a,h)anthracene	53-70-3	<10	U
1,2-Dichlorobenzene	95-50-1	<10	U
1,3-Dichlorobenzene	541-73-1	<10	U
1,4-Dichlorobenzene	106-46-7	<10	U
3,3'-Dichlorobenzidine	91-94-1	<20	U
Dimethyl Phthalate	131-11-3	<10	U
Diethylphthalate	84-66-2	<10	U
Di-n-Butylphthalate	84-74-2	<10	U
2,4-Dinitrotoluene	121-14-2	<10	U
2,6-Dinitrotoluene	606-20-2	<10	U
Di-n-octyl Phthalate	117-84-0	<10	U
bis(2-ethylhexyl)Phthalate	117-81-7	<10	U
Fluoranthene	206-44-0	<10	U
Fluorene	86-73-7	<10	U
Hexachlorobenzene	118-74-1	<10	U
Hexachlorobutadiene	87-68-3	<10	U
Hexachlorocyclopentadiene	77-47-4	<10	U
Hexachloroethane	67-72-1	<10	U
Indeno(1,2,3-c,d)pyrene	193-39-5	<10	U
Isophorone	78-59-1	<10	U
1-Methylnaphthalene	90-12-0	<10	U
2-Methylnaphthalene	91-57-6	<10	U
Naphthalene	91-20-3	<10	U
Nitrobenzene	98-95-3	<10	U
N-Nitrosodimethylamine	62-75-9	<10	U
N-nitroso-Di-n-propylamine	621-64-7	<10	U
N-nitrosodiphenylamine	86-30-6	<10	U
Phenanthrene	85-01-8	<10	U
Pyrene	129-00-0	<10	U
Pyridine	110-86-1	<20	U
1,2,4-Trichlorobenzene	120-82-1	<10	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added-ug/L	Measured-ug/L	%Rec	QC Limits
Nitrobenzene-d5	100	66.7	67	35--114
2-Fluorobiphenyl	100	66.4	66	43--116
Terphenyl-d14	100	83.6	84	33--141

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: AM Reviewing Supervisor: AM

/disk3/SV5972.i/sb061397.b/13jun1201012.d

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FAX (406) 252-6069 • 1-800-735-4489

Client: MT Dept of Environmental Quality  
Date Sampled: 29-MAY-97 16:50  
Date Received: 30-MAY-97  
Extraction Date: 02-JUN-1997  
Analysis Date: 13-JUN-97 21:02  
Project Info: Burlington Northern Livingston  
Sample Info: L-87-8

Lab No.: 97-33026  
Report Date: 06/16/97 07:22  
Sample Matrix: WATER  
Extraction Method: KPA 3510  
Prep Info: 1000ml to 1ml

**EPA METHOD 8270B: SEMI-VOLATILE ORGANICS ANALYSIS REPORT**

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
Acenaphthene	83-32-9	<10	4.0J
Acenaphthylene	208-96-8	<10	U
Anthracene	120-12-7	<10	U
Azobenzene	103-33-3	<10	U
Benzidine	92-87-5	<20	U
Benzo(a) Anthracene	56-55-3	<10	U
Benzo(b) fluoranthene	205-99-2	<10	U
Benzo(k) fluoranthene	207-08-9	<10	U
Benzo(g,h,i) perylene	191-24-2	<10	U
Benzo(a) pyrene	50-32-8	<10	U
4-Bromophenyl-phenylether	101-55-3	<10	U
Butylbenzylphthalate	85-68-7	<10	U
bis(-2-Chloroethoxy) Methane	111-91-1	<10	U
bis(-2-Chloroethyl) Ether	111-44-4	<10	U
bis(2-Chloroisopropyl) ether	108-60-1	<10	U
2-Chloronaphthalene	91-58-7	<10	U
4-Chlorophenyl-phenylether	7005-72-3	<10	U
Chrysene	218-01-9	<10	U
Dibenzo(a,h) anthracene	53-70-3	<10	U
1,2-Dichlorobenzene	95-50-1	<10	U
1,3-Dichlorobenzene	541-73-1	<10	U
1,4-Dichlorobenzene	106-46-7	<10	U
3,3'-Dichlorobenzidine	91-94-1	<20	U
Dimethyl Phthalate	131-11-3	<10	U
Diethylphthalate	84-66-2	<10	U
Di-n-Butylphthalate	84-74-2	<10	U
2,4-Dinitrotoluene	121-14-2	<10	U
2,6-Dinitrotoluene	606-20-2	<10	U
Di-n-octyl Phthalate	117-84-0	<10	U
bis(2-ethylhexyl) Phthalate	117-81-7	<10	U
Fluoranthene	206-44-0	<10	U
Fluorene	86-73-7	<10	5.1J
Hexachlorobenzene	118-74-1	<10	U
Hexachlorobutadiene	87-68-3	<10	U
Hexachlorocyclopentadiene	77-47-4	<10	U
Hexachloroethane	67-72-1	<10	U
Indeno(1,2,3-c,d) pyrene	193-39-5	<10	U
Isophorone	78-59-1	<10	U
1-Methylnaphthalene	90-12-0	<10	U
2-Methylnaphthalene	91-57-6	<10	U
Naphthalene	91-20-3	<10	U
Nitrobenzene	98-95-3	<10	U
N-Nitrosodimethylamine	62-75-9	<10	U
N-nitroso-Di-n-propylamine	621-64-7	<10	U
N-nitrosodiphenylamine	86-30-6	<10	U
Phenanthrene	85-01-8	<10	1.8J
Pyrene	129-00-0	<10	1.8J
Pyridine	110-86-1	<20	U
1,2,4-Trichlorobenzene	120-82-1	<10	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added-ug/L	Measured-ug/L	%Rec	QC Limits
Nitrobenzene-d5	100	66.3	66	35--114
2-Fluorobiphenyl	100	69.7	70	43--116
Terphenyl-d14	100	82.8	83	33--141

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

- U= Indicates compound was analyzed for but not detected.  
J= Estimated value. Present, but less than the limit of quantitation.

**REPORT COMMENTS:** NoneAnalyst: AM Reviewing Supervisor: AM

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FAX (406) 252-6069 • 1-800-735-4489

Client: MT Dept of Environmental Quality  
Date Sampled: 29-MAY-97 17:42  
Date Received: 30-MAY-97  
Extraction Date: 02-JUN-1997  
Analysis Date: 13-JUN-97 19:37  
Project Info: Burlington Northern Livingston  
Sample Info: L-87-7

Lab No.: 97-33027  
Report Date: 06/16/97 07:22  
Sample Matrix: WATER  
Extraction Method: EPA 3510  
Prep Info: 1000ml to 1ml

**EPA METHOD 8270B: SEMI-VOLATILE ORGANICS ANALYSIS REPORT**

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
Acenaphthene	83-32-9	<10	5.1J
Acenaphthylene	208-96-8	<10	U
Anthracene	120-12-7	<10	U
Azobenzene	103-33-3	<10	U
Benzidine	92-87-5	<20	U
Benzo(a)Anthracene	56-55-3	<10	U
Benzo(b)fluoranthene	205-99-2	<10	U
Benzo(k)fluoranthene	207-08-9	<10	U
Benzo(g,h,i)perylene	191-24-2	<10	U
Benzo(a)pyrene	50-32-8	<10	U
4-Bromophenyl-phenylether	101-55-3	<10	U
Butylbenzylphthalate	85-68-7	<10	U
bis(-2-Chloroethoxy)Methane	111-91-1	<10	U
bis(-2-Chloroethyl)Ether	111-44-4	<10	U
bis(2-Chloroisopropyl) ether	108-60-1	<10	U
2-Chloronaphthalene	91-58-7	<10	U
4-Chlorophenyl-phenylether	7005-72-3	<10	U
Chrysene	218-01-9	<10	U
Dibenzo(a,h)anthracene	53-70-3	<10	U
1,2-Dichlorobenzene	95-50-1	<10	U
1,3-Dichlorobenzene	541-73-1	<10	U
1,4-Dichlorobenzene	106-46-7	<10	U
3,3'-Dichlorobenzidine	91-94-1	<20	U
Dimethyl Phthalate	131-11-3	<10	U
Diethylphthalate	84-66-2	<10	U
Di-n-Butylphthalate	84-74-2	<10	U
2,4-Dinitrotoluene	121-14-2	<10	U
2,6-Dinitrotoluene	606-20-2	<10	U
Di-n-octyl Phthalate	117-84-0	<10	U
bis(2-ethylhexyl) Phthalate	117-81-7	<10	U
Fluoranthene	206-44-0	<10	U
Fluorene	86-73-7	<10	7.2J
Hexachlorobenzene	118-74-1	<10	U
Hexachlorobutadiene	87-68-3	<10	U
Hexachlorocyclopentadiene	77-47-4	<10	U
Hexachloroethane	67-72-1	<10	U
Indeno(1,2,3-c,d)pyrene	193-39-5	<10	U
Isophorone	78-59-1	<10	U
1-Methylnaphthalene	90-12-0	39	
2-Methylnaphthalene	91-57-6	15	
Naphthalene	91-20-3	11	
Nitrobenzene	98-95-3	<10	U
N-Nitrosodimethylamine	62-75-9	<10	U
N-nitroso-Di-n-propylamine	621-64-7	<10	U
N-nitrosodiphenylamine	86-30-6	<10	U
Phenanthrene	85-01-8	<10	4.9J
Pyrene	129-00-0	<10	U
Pyridine	110-86-1	<20	U
1,2,4-Trichlorobenzene	120-82-1	<10	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added-ug/L	Measured-ug/L	%Rec	QC Limits
Nitrobenzene-d5	100	66.1	66	35--114
2-Fluorobiphenyl	100	67.6	68	43--116
Terphenyl-d14	100	84.1	84	33--141

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: AMReviewing Supervisor: mm

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FAX (406) 252-6069 • 1-800-735-4489

Client: MT Dept of Environmental Quality  
Date Sampled: 29-MAY-97 18:45  
Date Received: 30-MAY-97  
Extraction Date: 02-JUN-1997  
Analysis Date: 13-JUN-97 20:19  
Project Info: Burlington Northern Livingston  
Sample Info: L-87-4

Lab No.: 97-33028  
Report Date: 06/16/97 07:22  
Sample Matrix: WATER  
Extraction Method: EPA 3510  
Prep Info: 1000ml to 1ml

## EPA METHOD 8270B: SEMI-VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS No.	RESULT	QUALIFIER
Acenaphthene	83-32-9	<10	U
Acenaphthylene	208-96-8	<10	U
Anthracene	120-12-7	<10	U
Azobenzene	103-33-3	<10	U
Benizidine	92-87-5	<20	U
Benzo(a) Anthracene	56-55-3	<10	U
Benzo(b) fluoranthene	205-99-2	<10	U
Benzo(k) fluoranthene	207-08-9	<10	U
Benzo(g,h,i) perylene	191-24-2	<10	U
Benzo(a) pyrene	50-32-8	<10	U
4-Bromophenyl-phenylether	101-55-3	<10	U
Butylbenzylphthalate	85-68-7	<10	U
bis(-2-Chloroethoxy) Methane	111-91-1	<10	U
bis(-2-Chloroethyl) Ether	111-44-4	<10	U
bis(2-Chloroisopropyl) ether	108-60-1	<10	U
2-Chloronaphthalene	91-58-7	<10	U
4-Chlorophenyl-phenylether	7005-72-3	<10	U
Chrysene	218-01-9	<10	U
Dibenzo(a,h) anthracene	53-70-3	<10	U
1,2-Dichlorobenzene	95-50-1	<10	U
1,3-Dichlorobenzene	541-73-1	<10	U
1,4-Dichlorobenzene	106-46-7	<10	U
3,3'-Dichlorobenzidine	91-94-1	<20	U
Dimethyl Phthalate	131-11-3	<10	U
Diethylphthalate	84-66-2	<10	U
Di-n-Butylphthalate	84-74-2	<10	U
2,4-Dinitrotoluene	121-14-2	<10	U
2,6-Dinitrotoluene	606-20-2	<10	U
Di-n-octyl Phthalate	117-84-0	<10	U
bis(2-ethylhexyl) Phthalate	117-81-7	<10	U
Fluoranthene	206-44-0	<10	U
Fluorene	86-73-7	<10	U
Hexachlorobenzene	118-74-1	<10	U
Hexachlorobutadiene	87-68-3	<10	U
Hexachlorocyclopentadiene	77-47-4	<10	U
Hexachloroethane	67-72-1	<10	U
Indeno(1,2,3-c,d) pyrene	193-39-5	<10	U
Isophorone	78-59-1	<10	U
1-Methylnaphthalene	90-12-0	<10	U
2-Methylnaphthalene	91-57-6	<10	U
Naphthalene	91-20-3	<10	U
Nitrobenzene	98-95-3	<10	U
N-Nitrosodimethylamine	62-75-9	<10	U
N-nitroso-Di-n-propylamine	621-64-7	<10	U
N-nitrosodiphenylamine	86-30-6	<10	U
Phenanthrene	85-01-8	<10	U
Pyrene	129-00-0	<10	U
Pyridine	110-86-1	<20	U
1,2,4-Trichlorobenzene	120-82-1	<10	U

### SURROGATE RECOVERY REPORT

Surrogate Compound	Added-ug/L	Measured-ug/L	%Rec	QC Limits
Nitrobenzene-d5	100	61.6	62	35--114
2-Fluorobiphenyl	100	64.0	64	43--116
Terphenyl-d14	100	80.4	80	33--141

#### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: AM Reviewing Supervisor: MD

/disk3/SV5972.i/sb061397.b/13jun1401014.d



**EPA METHOD 8270B: QUALITY ASSURANCE BLANK MATRIX SPIKE REPORT**

Quality Control Sample: Certified Reference Sample Analysis 06-JUN-1997 10:13

Report Date: 06/13/97 16:22

Extraction Method: EPA 3520

Extraction Date: 30-MAY-1997 00:00

Sample Matrix: WATER

File: /disk3/SV5972.i/sb060697.b/06jun0301003bn.d

Remarks: This certified reference sample was spiked into a blank sample matrix then extracted and analyzed with your set of samples to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate results.

CONCENTRATION UNITS = ug/L (ppb)				
Spike Compound	Added	Measured	%Rec	QC Limits
=====	=====	=====	=====	=====
Acenaphthene	50.0	34.3	69	47--145
Anthracene	50.0	34.7	69	27--133
Benzo(b)fluoranthene	50.0	40.7	81	24--159
Benzo(g,h,i)perylene	50.0	32.6	65	10--219
Benzo(a)pyrene	50.0	37.1	74	17--163
4-Bromophenyl-phenylether	50.0	35.1	70	53--127
Butylbenzylphthalate	50.0	34.6	69	10--152
4-Chlorophenyl-phenylether	50.0	33.2	66	25--158
Chrysene	50.0	35.6	71	17--168
Dibenzo(a,h)anthracene	50.0	34.3	69	10--227
1,4-Dichlorobenzene	50.0	27.8	56	20--124
Dimethyl Phthalate	50.0	36.2	72	10--112
bis(2-ethylhexyl)Phthalate	50.0	34.7	69	10--158
Fluoranthene	50.0	37.1	74	26--137
Fluorene	50.0	33.8	68	59--121
Hexachloroethane	50.0	27.1	54	40--113
Naphthalene	50.0	33.4	67	21--133
Nitrobenzene	50.0	33.5	67	35--180

SURROGATE RECOVERY REPORT				
Surrogate Compound	Added-ug/L	Measured-ug/L	%Rec	QC Limits
Nitrobenzene-d5	100	74.7	75	35--114
2-Fluorobiphenyl	100	77.3	77	43--116
Terphenyl-d14	100	81.3	81	33--141

REPORT COMMENTS: None

Analyst: AK      Reviewing Supervisor: gmy

Quality Control Sample: Laboratory Reagent Blank 06-JUN-1997 08:57  
 Report Date: 06/13/97 16:22  
 Extraction Method: EPA 3520  
 Extraction Date: 30-MAY-1997 00:00  
 Sample Matrix: WATER

Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 8270B: SEMI-VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
Acenaphthene	83-32-9	<10	U
Acenaphthylene	208-96-8	<10	U
Anthracene	120-12-7	<10	U
Azobenzene	103-33-3	<10	U
Benzidine	92-87-5	<20	U
Benzo(a)Anthracene	56-55-3	<10	U
Benzo(b)fluoranthene	205-99-2	<10	U
Benzo(k)fluoranthene	207-08-9	<10	U
Benzo(g,h,i)perylene	191-24-2	<10	U
Benzo(a)pyrene	50-32-8	<10	U
4-Bromophenyl-phenylether	101-55-3	<10	U
Butylbenzylphthalate	85-68-7	<10	U
bis(-2-Chloroethoxy)Methane	111-91-1	<10	U
bis(-2-Chloroethyl)Ether	111-44-4	<10	U
bis(2-Chloroisopropyl)ether	108-60-1	<10	U
2-Chloronaphthalene	91-58-7	<10	U
4-Chlorophenyl-phenylether	7005-72-3	<10	U
Chrysene	218-01-9	<10	U
Dibenzo(a,h)anthracene	53-70-3	<10	U
1,2-Dichlorobenzene	95-50-1	<10	U
1,3-Dichlorobenzene	541-73-1	<10	U
1,4-Dichlorobenzene	106-46-7	<10	U
3,3'-Dichlorobenzidine	91-94-1	<20	U
Dimethyl Phthalate	131-11-3	<10	U
Diethylphthalate	84-66-2	<10	U
Di-n-Butylphthalate	84-74-2	<10	U
2,4-Dinitrotoluene	121-14-2	<10	U
2,6-Dinitrotoluene	606-20-2	<10	U
Di-n-octyl Phthalate	117-84-0	<10	U
bis(2-ethylhexyl) Phthalate	117-81-7	<10	U
Fluoranthene	206-44-0	<10	U
Fluorene	86-73-7	<10	U
Hexachlorobenzene	118-74-1	<10	U
Hexachlorobutadiene	87-68-3	<10	U
Hexachlorocyclopentadiene	77-47-4	<10	U
Hexachloroethane	67-72-1	<10	U
Indeno(1,2,3-c,d)pyrene	193-39-5	<10	U
Isophorone	78-59-1	<10	U
1-Methylnaphthalene	90-12-0	<10	U
2-Methylnaphthalene	91-57-6	<10	U
Naphthalene	91-20-3	<10	U
Nitrobenzene	98-95-3	<10	U
N-Nitrosodimethylamine	62-75-9	<10	U
N-nitroso-Di-n-propylamine	621-64-7	<10	U
N-nitrosodiphenylamine	86-30-6	<10	U
Phenanthrene	85-01-8	<10	U
Pyrene	129-00-0	<10	U
Pyridine	110-86-1	<20	U
1,2,4-Trichlorobenzene	120-82-1	<10	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added-ug/L	Measured-ug/L	%Rec	QC Limits
Nitrobenzene-d5	100	71.1	71	35--114
2-Fluorobiphenyl	100	76.6	77	43--116
Terphenyl-d14	100	79.1	79	33--141

QUALIFIER CODE EXPLANATIONS AND NOTES:

U\* Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: SW Reviewing Supervisor: MD

/disk3/SV5972.i/eb060697.b/06jun0101001bn.d

**ENERGY LABORATORIES, INC.**

P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325  
FAX (406) 252-6069 • 1-800-735-4489

**LABORATORY REPORT**

TO: John Wadhams  
ADDRESS: MT Dept. of Environmental Quality  
P.O. Box 200901  
Helena, MT 59620-0901

LAB NO.: 97-33022-28

DATE: 06/16/97 kr

WATER ANALYSIS

Burlington Northern, Livingston  
Sampled 05/29/97  
Submitted 05/30/97  
Analyzed 06/02/97

<u>Lab No.</u>	<u>Identification</u>	Total Petroleum Hydrocarbons, <u>mg/l (ppm)</u>
97-33022	L-87-3, Sampled @ 0930	<0.1
97-33023	Well 3, Sampled @ 1205	<0.1
97-33024	L-88-10, Sampled @ 1414	<0.1
97-33025	L-88-13, Sampled @ 1523	<0.1
97-33026	L-87-8, Sampled @ 1650	26.4
97-33027	L-87-7, Sampled @ 1742	3.4
97-33028	L-87-4, Sampled @ 1845	2.4

Analysis done by EPA Method 418.1.

Lab Nos. 97-33022-28

QUALITY ASSURANCE DATA PACKAGE

This report includes the results of quality assurance tests performed with the sample analyses. They are performed to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate and precise results.

<u>Constituent</u>	<u>Duplicate Analysis</u>		<u>Spiked</u>	<u>Blank</u> <u>Analysis,</u> <u>mg/l (ppm)</u>	<u>-----Calibration Verification-----</u>		<u>Date</u> <u>Analyzed</u>
	<u>-----mg/l (ppm)-----</u>		<u>Analysis,</u>		<u>Sample</u>	<u>Acceptance</u>	
	<u>Original</u>	<u>Duplicate</u>	<u>Recovery</u>		<u>Analysis,</u>	<u>Range,</u>	
			<u>%</u>		<u>mg/l (ppm)</u>	<u>mg/l (ppm)</u>	
Total Petroleum Hydrocarbons	N/A	N/A	N/A	<0.1	1.0	0.8-1.2	06/02/97

Analysis done by EPA Method 418.1.

Lab Nos.: 97-33022 - 97-33028

Date: 30-MAY-97

Received by: Pam Fink

Logged In by: Pam Fink

### SAMPLE CONDITION QA/QC REPORT

This report provides information about the condition of the sample(s)  
and associated sample custody information on receipt at the laboratory.

Chain of Custody Form

Completed & Signed

Yes Comments: \_\_\_\_\_

Chain of Custody Seal

No Comments: \_\_\_\_\_

Intact

N/A Comments: \_\_\_\_\_

Signature Match Chain of Custody vs. Seal

N/A Comments: \_\_\_\_\_

Samples Received Cold

Yes Comments: \_\_\_\_\_

Samples Received Within Holding Time

Yes Comments: \_\_\_\_\_

Samples Received in Proper Containers

Yes Comments: \_\_\_\_\_

Samples Received Properly Preserved

Yes Comments: \_\_\_\_\_

Samples requiring analysis for volatile organics are tested for proper preservation at the time of analysis.  
Any preservation problems encountered for these samples are noted on the analytical parameter report pages.

Client notified about sample discrepancies:

Who: \_\_\_\_\_

By: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Method of Shipping: Greyhound 1303593093

Additional comments: \_\_\_\_\_



[illegible]

ENERGY LABORATORIES, INC

P.O. Box 30916

1120 South 27th Street

Billings, Montana 59107

toll-free 800-735-4489

voice 406-252-6325

fax 406-252-6069

CHAIN OF CUSTODY RECORD

PLEASE PRINT OR TYPE ALL INFORMATION EXCEPT SIGNATURES

P.O. #

Project Name / Address

Contact Name & Phone

John Wadhams

444-0495

DATE

TIME

Invoice to:

Report to:

composite

grab sample

number of containers

Sample Type: A W S V U O

Air Water Soils/solids Vegetation Urine Other

Analysis Requested

8270 Base/Neutrels only

Comments, Special Instructions, etc.

5/29/97

9:30a

✓

L-87-3

2-W

X

11

12:05p

✓

Well 3

11

11

11

2:12p

✓

L-88-10

11

11

11

3:23p

✓

L-88-13

11

11

11

4:59p

✓

L-87-8

11

11

11

5:42p

✓

L-87-7

11

11

11

6:45p

✓

L-87-4

11

11

product in well

water smells diesel

product in well

water smells like diesel

product in well

water smells like diesel

1. Relinquished (signature)

John Wadhams

5/30/97

9:00am

2. Relinquished (signature)

grabbed bus to Energy

5/30/97

1:55pm

Received by: (signature)

Received by: (signature)

Relinquished (signature)

Received for laboratory by (signature):

## **APPENDIX B**

### **DATA VALIDATION REPORT**



# DATA VALIDATION REPORT FOR GROUND WATER ANALYSES LIVINGSTON RAIL YARD, LIVINGSTON, MONTANA NOVEMBER 1996 AND MAY 1997 SAMPLING ROUNDS

## 1.0 INTRODUCTION

Data validation levels have been established for the sample rounds according to the criteria described in Appendix 1.A of the Remedial Investigation Report (Envirocon, 1994). The data validation levels and codes for the Livingston Rail Yard project are based on the U.S. Environmental Protection Agency region VIII guidance, "Evaluation Criteria for Existing Data from CERCLA Study Areas", Revision 1, January 5, 1985.

Table 1 lists the samples taken during the November 1996 and May 1997 sample rounds.

**TABLE 1**  
**November 1996 and May 1997 Ground Water Samples**

Sample Number	Sample Location	Sample Date	Analyses
140101-1530	94-1	11/11/97	601
140101-1531	89-9	11/11/97	601
140101-1532	L-88-10	11/12/96	601
140101-1533	L-87-8	11/12/97	601
140101-1534	90-3	11/12/97	601
140101-1535	90-3 dup.	11/12/97	601
140101-1536	L-87-2	11/12/97	601
140101-1537	92-2	11/12/97	601
140101-1538	89-3	11/12/97	601
140101-1539	94-1	11/13/97	601
140101-1540	Trip blank	11/14/97	601
140101-1541	4	5/27/97	601
140101-1542	5	5/27/97	601
140101-1543	Trip blank	5/27/97	601
140101-1544	6	5/27/97	601
140101-1545	1	5/28/97	601
140101-1546	LS-11	5/28/97	601
140101-1547	90-3	5/28/97	601
140101-1548	89-6	5/28/97	601
140101-1549	89-6 dup.	5/28/97	601
140101-1550	89-10	5/28/97	601
140101-1551	L-87-3	5/29/97	601
140101-1552	3	5/29/97	601
140101-1553	L-88-10	5/29/97	524.2
140101-1554	Trip blank	5/29/97	601
140101-1555	L-88-13	5/29/97	524.2
140101-1556	L-87-8	5/29/97	524.2
140101-1557	L-87-7	5/29/97	524.2
140101-1558	L-87-7 dup.	5/29/97	524.2
140101-1559	L-87-4	5/29/97	524.2
140101-1560	L-87-2	5/30/97	524.2



**TABLE 1 (cont.)**  
**November 1996 and May 1997 Ground Water Samples**

Sample Number	Sample Location	Sample Date	Analyses
140101-1561	89-4	5/30/97	601
140101-1562	L-87-5	5/30/97	601
140101-1563	92-1	5/30/97	601
140101-1564	89-3	6/2/97	601
140101-1565	L-88-10	6/3/97	NAP
140101-1566	L-87-3	6/3/97	NAP
140101-1567	L-87-1	6/3/97	NAP
140101-1568	89-9	6/3/97	601
140101-1569	89-9 dup.	6/3/97	601
140101-1570	89-2	6/4/97	601, NAP
140101-1571	L-87-2	6/4/97	NAP
140101-1572	Trip Blank	6/4/97	601
140101-1573	L-88-13	6/4/97	NAP
140101-1574	92-3	6/4/97	NAP
140101-1575	95-1	6/4/97	NAP
140101-1576	L-87-4	6/4/97	NAP
140101-1577	B Street	6/5/97	601
140101-1578	L-88-13	6/5/97	NAP
140101-1579	L-87-8	6/5/97	NAP
140101-1580	L-87-7	6/5/97	NAP
140101-1581	L-87-5	6/5/97	NAP
140101-1582	92-4	6/18/97	601
140101-1583	2	6/18/97	601, NAP

Notes:

NAP - Natural attenuation parameter analyses - SO<sub>4</sub>, NO<sub>3</sub>, Fe<sup>2+</sup>, CH<sub>4</sub>

## 2.0 EVALUATION OF BLANK ANALYSES

Laboratory and field blanks were analyzed for these sample rounds as summarized in Table 2. All of the laboratory blanks were reagent blanks. All of the field blanks were trip blanks.

**Table 2**  
**Field and Laboratory Blanks**

Sample Number	Laboratory Sample #	Sample Type	Sample Date	EPA Analytical Method
140101-1540	96-67480	Trip Blank	11/14/96	601
NA	Reagent Blank	Reagent Blank	11/21/96	624
NA	Reagent Blank	Reagent Blank	12/3/96	624
140101-1543	97-32730	Trip Blank	5/27/97	601
140101-1554	97-33050	Trip Blank	5/29/97	601
140101-1572	97-33559	Trip Blank	6/4/97	601
N/A	Reagent Blank	Reagent Blank	6/10/97	624
N/A	Reagent Blank	Reagent Blank	6/10/97	624
N/A	Reagent Blank	Reagent Blank	6/9/97	624
N/A	Reagent Blank	Reagent Blank	6/9/97	624
N/A	Reagent Blank	Reagent Blank	6/17/97	624

N/A	Reagent Blank	Reagent Blank	6/10/97	524.2
N/A	Reagent Blank	Reagent Blank	6/11/97	524.2

**Table 2 (cont.)  
Field and Laboratory Blanks**

Sample Number	Laboratory Sample #	Sample Type	Sample Date	EPA Analytical Method
N/A	Reagent Blank	Reagent Blank	6/18/97	624
N/A	Reagent Blank	Reagent Blank	6/22/97	624
N/A	Reagent Blank	Reagent Blank	7/2/97	624

Notes: N/A - Not applicable

Table 3 summarizes the compounds detected in the blanks. All of the detections were in the trip blanks. The only compounds detected in the trip blanks were methylene chloride and chloroform. The chloroform probably remains from the chlorinated water used to make the deionized water for the trip blanks. Methylene chloride is not a contaminant found in the ground water at the LRY. It may be a laboratory contaminant.

**Table 3  
Detections in Blank Samples**

Sample Number	Sample Date	Sample Type	Compounds Detected	Concentration
140101-1540	11/14/96	Trip Blank	Methylene Chloride	0.19J
140101-1540	11/14/96	Trip Blank	Chloroform	0.24J
140101-1543	5/29/97	Trip Blank	Chloroform	0.55
140101-1554	5/29/97	Trip Blank	Chloroform	0.52

Notes: J - detection was below the practical quantification limit.

### 3.0 EVALUATION OF DUPLICATE ANALYSES

Twelve sets of field duplicates and three sets of laboratory duplicates were analyzed during the November 1996, and May 1997 sample rounds. Table 4 summarizes the locations and dates of the duplicate samples.

None of the field duplicates exceeded a relative percent difference (rpd) of 30%. The laboratory duplicate for sample 140101-1539 contained a PCE concentration that was less than 50% of the value of the primary sample (1.7 ug/l vs. 3.6 ug/l). This exceeds the 30% rpd limit; therefore, sample 140101-1539 has been degraded to qualitative status. All other samples from the November 1996 and May 1997 sample rounds are validated at quantitative status.

**Table 4**  
**Duplicate Sample Analyses**

<b>Sample Number</b>	<b>Sample Location</b>	<b>Sample Type</b>	<b>Sample Date</b>	<b>Analyses</b>
140101-1534	90-3	Pirmary Sample	11/12/97	601
140101-1535	90-3	Field Duplicate	11/12/97	601
140101-1539	94-1	Primary Sample	11/13/97	601
140101-1539	94-1	Lab. Duplicate	11/13/97	601
140101-1541	4	Primary Sample	5/27/97	601
140101-1541	4	Lab. Duplicate	5/27/97	601
140101-1548	89-6	Primary Sample	5/28/97	601
140101-1549	89-6	Field Duplicate	5/28/97	601
140101-1557	L-87-7	Primary Sample	5/29/97	524.2
140101-1558	L-87-7	Field Duplicate	5/29/97	524.2
140101-1559	L-87-4	Primary Sample	5/29/97	524.2
140101-1559	L-87-4	Lab. Duplicate	5/29/97	524.2
140101-1568	89-9	Primary Sample	6/3/97	601
140101-1569	89-9	Field Duplicate	6/3/97	601
140101-1577	B-Street	Primary Sample	6/05/97	601
140101-1577	B-Street	Lab. Duplicate	6/05/97	601

#### **4.0 EVALUATION OF HOLDING TIMES**

All of the samples were preserved by being acidified to pH values below 2.0. Properly preserved samples for analysis by EPA Method 601/624 and 524.2 can be stored for up to 14 days prior to analysis. A review of all holding times revealed that none of the samples collected during these sample round exceeded 14-day holding period.

#### **5.0 EVALUATION OF MATRIX AND SURROGATE SPIKE RESULTS**

All matrix spike and surrogate spike recoveries were within acceptable limits. All U.S. EPA water supply quality control samples were within recovery limits. The matrix spike, surrogate spike, and U.S. EPA water supply quality control sample results are provided in Appendix A of this report.

#### **6.0 VALIDATION LEVEL ASSIGNMENTS**

The analytical results from one sample (140101-1539) have been degraded to qualitative status due to poor match with a laboratory duplicate. All other analytical results for the November 1996 and May 1997 sample rounds are acceptable for quantitative data analysis.



